

A Synopsis of the New World Species belonging to the
Nesomyrmex-Group of the Ant Genus *Leptothorax* Mayr
(Hymenoptera: Formicidae)

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(With 31 figures)

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Among the less known ants of the Neotropical region figure the species of *Leptothorax*. Owing to their relatively small size, their lack of economic importance and their unobtrusive habits, they do not easily catch the eyes of insect collectors, who still find occasionally stray individuals in their sweeping net or beating cloth. Most if not all species of these ants seem to lead a strictly arboreal life and to nest in preformed plant cavities. Although many have been taken in the United States on imported South American orchids of the genera *Cattleya*, *Oncidium* and *Epidendrum*, this does not mean that orchids are the preferred plant hosts or nesting site. Colonies of the same group of ants are not less frequently found inside of hollow dead vines and twigs of many kinds of shrubs and trees. Thus upon one occasion I have found a number of colonies of *L. spininodis* within the medullary cavity of withered coffee branches at Agudos, São Paulo State, Brazil.

All Neotropical species, with the exception of the Central American *stolli* Forel (1894) and the Mexican *striatulus* Stitz (1937), belong to the clearly circumscribed subgenus *Nesomyrmex* Wheeler (formerly *Goniothorax* Emery *nec* Milne-Edwards). At least two striking patterns become at once apparent in the distribution of the *Nesomyrmex* species. First of all, there seems to be zonation, inasmuch as all species are more or less confined to the warmer — tropical or subtropical — portions of the Old World (Africa and Madagascar) and the New World (Central and South America). Secondly, except for peripheral overlap, they seem to possess exclusively the bulk of their territory, not sharing it with species of other subgenera of *Leptothorax*. In the New World, only *wilda* ranges north and outside of the Neotropical region, although it seemingly occurs also in tropical Mexico, if the Plant Quarantine interception record as of Vera Cruz State is trustworthy.

The present study deals with a preliminary species-level revision of the neotropical forms of the *Nesomyrmex*-group. A review of the extra-American species and of the subgenus itself would have been desirable, but was not possible at this time. Nevertheless, it is believed that this investigation is at least a contribution toward that goal.

In a previous paper (Kempf, 1958) I have already had a chance of discussing several species of Neotropical *Nesomyrmex* and of pointing out the darker areas that harass their taxonomy. Due to the splendid cooperation of many persons and institutions, I have been able to see in the meantime the types of a great many species of this complex. For this reason I decided to continue my studies and to present a revisionary synopsis of all American species of the subgenus.

Acknowledgments. — The material, on which this study is based, has been received on loan, exchange or as a gift from the following sources:

- CTB — Collection of Father T. Borgmeier, Sc. D., now in the possession of this author.
- DZSP — Departamento de Zoologia do Estado de São Paulo (Collection organized by the late Hermann Luederwaldt).
- HDOX — Hope Department of Entomology, University Museum, Oxford (Crawley Collection). Courtesy of Mr. Ernest Taylor.
- MCSN — Museo Civico di Storia Naturale, Genova, Italy (Emery Collection). Courtesy of Dr. Delfa Guiglia.
- MCZ — Museum of Comparative Zoology, Harvard University (Wheeler collection). Courtesy of Dr. W. L. Brown, Jr.
- NHMB — Naturhistorisches Museum, Basel, Switzerland (Santschi Collection). Courtesy of Drs. E. Handschin and F. Keiser.
- NHMW — Naturhistorisches Museum, Wien, Austria (Mayr Collection). Courtesy of Dr. Max Fischer.
- USNM — United States National Museum, Washington, D. C. Courtesy of Dr. M. R. Smith.
- WWK — This author's private collection.

Dr. Neal A. Weber, of Swarthmore College, and Dr. Karol Lenko of the Faculdade de Higiene do Estado de São Paulo, have given me samples of the material existing in their private collections. To all these persons and institutions I wish to express my sincere thanks.

Drawings. — All drawings were made with the aid of a Leitz binocular stereoscopic wide-field microscope and an O. P. L. (Optique de Précision de Levallois, Paris) Camera Lucida.

Genus *Leptothorax* Mayr

Subgenus *Nesomyrmex* W. M. Wheeler

Leptothorax subg. *Goniothorax* Emery, 1896, Bull. Soc. Ent. Ital. 28 : 58 (nec Milne-Edwards, 1879). *Præocc.* — Type: *L. vicinus* Mayr (Designation by Wheeler, 1911).
Nesomyrmex W. M. Wheeler, 1910, Bull. Amer. Mus. Nat. Hist. 28 : 259. — M. R. Smith, 1950, Psyche, 57 : 30. Type: *N. clavipilis* Wheeler (Monobasic).
cautomyrma Forel, 1915, Bull. Soc. Vaud. Sci. Nat. 50 : 233. — Forel, 1915, Bull. Soc. Vaud. Sci. Nat. 50 : 364. — Type: *L. echinatinodis* Forel (Original designation).

Subgeneric characters (after Emery, 1922, p. 249)

Worker. — Palpi 5-3. 11 or 12 antennal segments; funiculus with more or less differentiated three-segmented apical club. Humeri of pronotum angulate or even dentate. Epinotum with a pair of spines.

Female. — As worker, but epinotal spines short or vestigial to absent. Mesonotal scutum and scutellum noticeably depressed and flattened. Fore wing with a short closed radial and no discoidal cell.

Male. — Palpi 5(4)-3. Antennae 12 or 13-segmented, if 13, two of the intermediate segments partly ankylosed; scape as long as basal 3-4 funicular segments combined. Humeri of pronotum angulate. Wings as in female.

The morphological distinctness of the imaginal stages and the distribution of the species may even suggest to accord *Nesomyrmex* full generic status. The larvae, however, are quite close to the holarctic subgenus *Leptothorax* s. str., according to G. C. & J. Wheeler (1955), who studied those of *echinatinodis*. The solution of this problem is beyond the scope and possibilities of the present investigation.

List of American Species with Synonyms

1. Species with 12-segmented antennae in worker and female:

- anduzei* Weber, 1943, worker (Venezuela, Colombia)
- brasiliensis* Kempt, 1958, worker, female (Brazil: Pernambuco)
- costatus* Emery, 1896, worker, female (SE. Brazil)
- itinerans*, n. sp., worker, female, male (Venezuela)
- pittieri* Forel, 1899, worker, female (So. Mexico to Panama)
- pulcher* Emery, 1917, worker (Bolivia)
- = *formosus* Emery, 1915 nec Santschi, 1909
- schwebeli* Forel, 1914, worker (Brazil: São Paulo)
- sculptiventris* Mayr, 1887, worker (SE. Brazil)
- = s. var. *borgmeieri* Wheeler, 1931 — Nov. Syn.
- = s. var. *distincta* Crawley, 1922 — Nov. Syn.
- = s. var. *major* Forel, 1899 — Nov. Syn.

tonsuratus, n. sp., female (Mexico; Brazil: Rio de Janeiro)
vicinus Mayr, 1887, worker, female (SE. Brazil; Argentina; Bolivia)
 = v. var. *testacea* Emery, 1894 — Nov. Syn.

II. Species with 11-segmented antennae in worker and female:

argentinus Santschi, 1922, worker (Argentina: Santiago del Estero)
asper Mayr, 1887, worker, female, male (Venezuela to N. Argentina)
 = *a.* var. *rufa* Emery, 1896 — Nov. Syn.
 = *a.* var. *sulfurea* Forel, 1912 — Nov. Syn.
clavipilis (Wheeler, 1910), female (Island of Grenada, B. W. I.)
echinatinodis Forel, 1886, worker, female (Mexico to S. Brazil)
 = *e.* var. *aculeatinodis* Emery, 1896 — Nov. Syn.
 = *e.* *cordicola* Wheeler, 1942 — Nov. Syn.
 = *e.* *dalmasi* Forel, 1899 — Nov. Syn.
 = *e.* *pungentinodis* Emery, 1896 — Nov. Syn.
 = *e.* *schmidti* Menozzi, 1927 — Nov. Syn.
pleuriticus Wheeler, 1921, worker, female, male (British Guiana) —
 Nov. Stat.
rutilans Kempf, 1958, worker, female (British Guiana)
spininodis Mayr, 1887, worker, female, male (Venezuela to N. Argentina)
 = *s.* var. *genualia* Santschi, 1922 — Nov. Syn.
 = *umbratilis* Wheeler, 1921 — Nov. Syn.
timidus, n. sp., worker (Venezuela)
tristani Emery, 1896, worker, female (Costa Rica to Venezuela)
 = *asper* var. *antoniensis* Forel, 1912 — Nov. Syn.
wilda M. R. Smith, 1943, worker, female (So. Texas to C. Mexico)

Key to the New World *Leptothorax* (*Nesomyrmex*) Species (Workers)

- (*L. tonsuratus*, n. sp. and *L. clavipilis* Wheeler, known only from females, are not keyed)
- 1. Antennae 12-segmented 2
 - Antennae 11-segmented 10
 - 2. Antennal scapes in repose attaining or surpassing the occipital margin (Fig. 24); larger species, thorax length 1.4 mm or more 3
 - Antennal scapes in repose failing to attain the occipital margin (Fig. 25); smaller species, thorax length 1.3 mm or less 5
 - 3. Humeri of pronotum obtusely angulate, almost rounded; petiolar and postpetiolar nodes lacking postero-laterally prominent spines or teeth 3. *sculptiventris* Mayr
 - Humeri of pronotum sharply angulate or even dentate (Figs. 1, 5); petiolar and postpetiolar nodes postero-laterally with prominent spines or teeth 4
 - 4. Mesonotum laterally projecting as a triangular lobe (Fig. 1); thorax strongly constricted in front and behind of this lobe 1. *pulcher* Emery
 - Mesonotum lacking laterally a projecting lobe (Fig. 5); thorax feebly constricted in front and behind of the mesonotum 2. *anduzei* Weber
 - 5. Head above longitudinally costate or rugose 6
 - Head above without longitudinal costae or rugae 9

6. Dorsum of thorax and postpetiole densely punctate with feebly raised longitudinal rugae; lateral lobe of mesonotum blunt (Fig. 2); epinotal spines lacking erect or oblique hairs..... 7. *itinerans*, n. sp.
- Dorsum of thorax and postpetiole with strongly raised longitudinal or somewhat vermiculate costae; lateral lobe of mesonotum dentate (Fig. 4); epinotal spines with erect or oblique hairs..... 7
7. Basal half of first gastric tergite finely and densely longitudinally striate; lateral border of dorsum of pronotum without a sharp continuous carina 6. *schwebeli* Forel
- First gastric tergite completely smooth and shining; lateral border of dorsum of pronotum with a sharp continuous carina..... 8
8. Metasternal lobe dorsally dentate; intervals between costae on thoracic dorsum with microsculpture and subopaque..... 5. *vicinus* Mayr
- Metasternal lobe evenly rounded, lacking a postero-dorsal tooth (Fig. 16); intervals between costae on thoracic dorsum smooth and shining 4. *costatus* Emery
9. Dorsum of head with numerous shallow foveolae; epinotal spines as long as the distance between their apices..... 8. *pittieri* Forel
- Dorsum of head without distinct foveolae; epinotal spines short and subconical, much shorter than the distance between their apices. 9. *brasiliensis* Kempf
10. Metasternal lobe postero-dorsally produced, either angulate or subangulate (Figs. 13, 14, 15, 22); antennal scape in repose usually attaining the occipital margin 11
- Metasternal lobe postero-dorsally not produced, short and evenly rounded (Fig. 17); antennal scape in repose usually, not always, failing to attain the occipital margin by a distance equalling its greatest width 14
11. Mandibles finely reticulate and subopaque at inner half of upper surface; sides of thorax rather coarsely and irregularly rugose.. 12
- Mandibles smooth and shining at inner half of upper surface; sides of thorax with feeble rugosities or lacking them completely..... 13
12. Sides of petiolar and postpetiolar node with 2-3 prominent teeth, the posteriormost longest; first gastric tergite usually distinctly broader than long (Fig. 11)..... 12. *tristani* Emery
- Sides of petiolar and postpetiolar node usually completely unarmed, never conspicuously armed, at most with a single prominent tooth on petiole; first gastric tergite usually distinctly longer than broad (Fig. 7) 11. *asper* Mayr
13. Front and vertex of head sculptured and opaque; legs lacking erect hairs 14. *timidus*, n. sp.
- Front and vertex of head smooth and shining; legs with long erect hairs 13. *pleuriticus* Wheeler
14. Anterior border of pronotum ecarinate; thorax completely smooth and shining 16. *rutilans* Kempf
- Anterior border of pronotum carinate; thorax always sculptured and opaque 15
15. Basal face of epinotum with a flattened, obtuse tooth at each side, separated from, and projecting over, the spiracle, which is invisible from above; pronotum almost as long as broad at posterior corner, not conspicuously transverse (Fig. 8) 15. *wilda* M. R. Smith
- Basal face of epinotum with a prominent lobe at each side, enclosing postero-dorsally the spiracle which is always visible from above; pronotum much broader than long (Fig. 9)..... 16

16. Antennal scapes and extensor face of tibiae with a few short erect setae; sides of mesonotum broadly rounded and scarcely projecting laterad; epinotal spines very short and straight (Fig. 6)..... 17. *argentinus* Santschi
- Antennal scapes and tibiae lacking standing hairs; sides of mesonotum with a projecting angular or dentate lobe; epinotal spines much longer and curved (Fig. 9)..... 17
17. Dorsum of head completely reticulate-punctate, longitudinally rugose and opaque; color rather uniformly testaceous or yellowish-brown.... 19. *spininodis* Mayr
- Dorsum of head with at least the front and vertex partly smooth and shining; color always darker, at least head and gaster brown to piceous 18. *echinatinodis* Forel

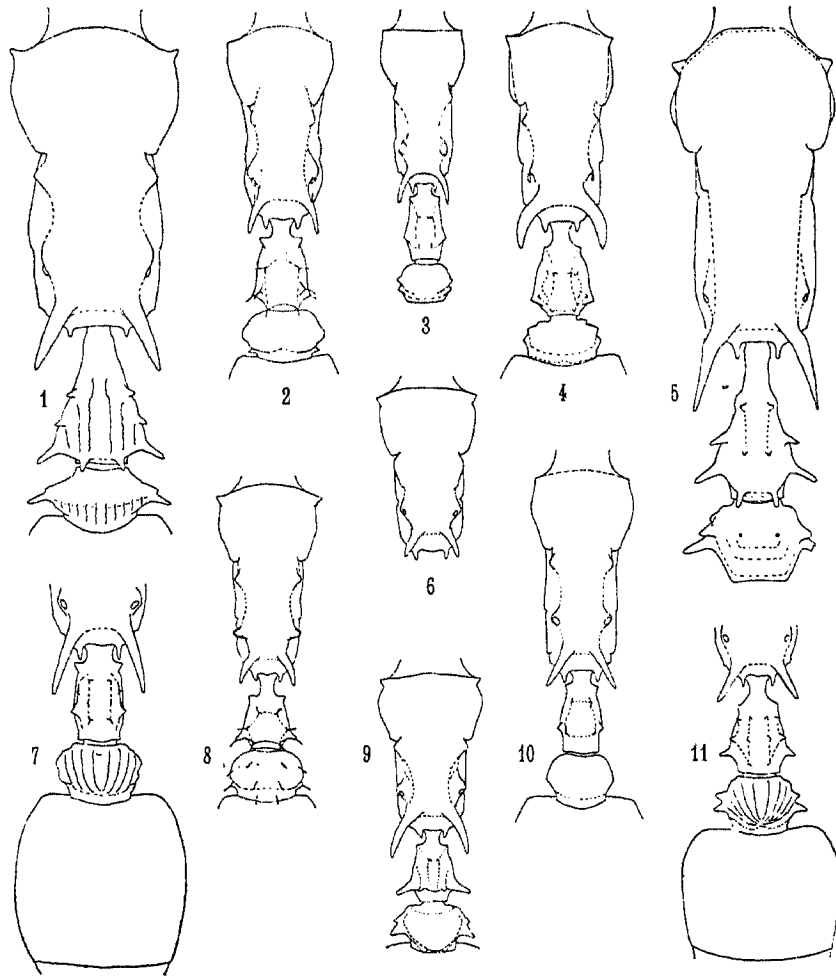
1. *Leptothorax* (*Nesomyrmex*) *pulcher* Emery

(Fig. 1)

Leptothorax (*Goniothorax*) *formosus* Emery, 1915 (nec Santschi, 1909). Boll. Lab. Zool. Scuola Agric. Portici 10 : 25-26 (Worker, Bolivia; Mapiri).
Leptothorax (*Goniothorax*) *pulcher* Emery, 1917. Bull. Soc. Ent. France, p. 96 (n. n.). — Emery, 1922, Gen. Ins. Subf. Myrmicinae, fasc. 174, p. 250, Pl. 5, fig. 9.

Type. — A single worker (holotype), from Mapiri, La Paz Province, Bolivia, received from Staudinger and deposited in the Emery collection (MCSN), has been examined.

Worker (holotype). — Total length 4.8 mm; maximum length of head capsule 1.19 mm; maximum width of head behind eyes 1.05 mm; length of scape, without basal condyle 1.05 mm; Weber's length of thorax 1.52 mm. Basic color light reddish-brown; head, except clypeus, black; gaster dark brown with a light transverse band on basal half of first tergite; funiculi, except fuscous apical club, and tibiae ferruginous. Opaque; finely and densely punctate. Mandibles somewhat shining, with longitudinal striae. Vertex and sides of head with numerous longitudinal rugae, connected with one another by transverse rugosities, giving the entire area a clathrate appearance; bottom of sides and occiput reticulate-rugose. Thoracic dorsum with strong, raised, somewhat vermiculate, longitudinal costae, about 9-10 on pronotum. Sides of thorax with similar sculpture, which is more irregular, becoming reticulate-rugose on the posterior half. Declivous face of epinotum with transverse rugosities. Dorsum of petiolar node with 4 conspicuous, vermiculate, longitudinal costae between the spines. Dorsum of postpetiole with short, more numerous, widely spaced longitudinal rugae. First gastric tergite densely punctate, opaque. Standing hairs thick, blunt at apex, very short and sparse, lacking completely on scapes and



Leptothorax (Nesomyrmex): thorax and pedicel in dorsal view. Fig. 1. *L. pulcher* Emery, holotype. — Fig. 2. *L. itinerans*, n. sp. holotype. — Fig. 3. *L. pleuriticus* Wheeler, syntype. — Fig. 4. *L. costatus* Emery, holotype. — Fig. 5. *L. anduzei* Weber, lectotype. — Fig. 6. *L. argentatus* Santschi, syntype. — Fig. 7. *L. asper* Mayr, syntype. — Fig. 8. *L. wilda* M. R. Smith, paratype. — Fig. 9. *L. spininodis* Mayr, lectotype. — Fig. 10. *L. timidus*, n. sp., holotype. — Fig. 11. *L. tristani* Emery (Monos Island).

legs. In the intervals between the rugae on head, especially toward the sides, there are minute, decumbent, sparse hairs. Scapes and legs with sparse, appressed, fine hairs.

Head subquadrate, little longer than broad. Compound eyes rather convex, situated somewhat in front of the middle of the sides of head, which are almost straight, slightly diverging caudad. Occipital corners broadly rounded. Scapes in repose surpassing the occipital margin. Antennae 12-segmented. Funiculus

with indistinct apical club of 3-4 segments. The shape of thorax (Fig. 1) imitates to some extent that of *spininodis*, but it is much larger and more elongate; dorsum flattened, weakly convex in profile, lacking an impression at the mesoepinotal junction. Pronotum with a strong, acute tooth on scapular corner; the sides submarginate and gently convex. A prominent triangular submarginate lobe at each side of mesonotum and base of epinotum. Epinotal spines straight, obliquely raised, diverging and tapering to a point toward apex, somewhat longer than the distance between their bases. Metasternal lobe rounded. Petiole elongate, the peduncle somewhat constricted at base, the node without a tooth anteriorly at base, but with three spines above at each side, the third spine being biggest, and a pair of spines at the posterior border. Postpetiole strongly transverse, in profile with a distinct anterior ascending face and a horizontal dorsal face; bearing at each side a bigger spine, at the base of which there is a short blunt denticle. Anterior border of gaster transversely truncate.

Discussion. — This species, of which only the holotype is known, is quite distinct from all other species. Closest are *sculptiventris* and *anduzei*, with which it agrees in larger size, long scape, rounded metasternal lobe, opaque and sculptured basal half of first gastric tergite. It differs from *sculptiventris* in the more opaque integument, the shorter head, the shape of thorax (scapular angle dentate, meso and epinotal lobes projecting laterad), the spines on petiole and postpetiole, the lack of longitudinal striae on the first gastric tergite. The differences from *anduzei*, its closest relative, will be given below, under that species.

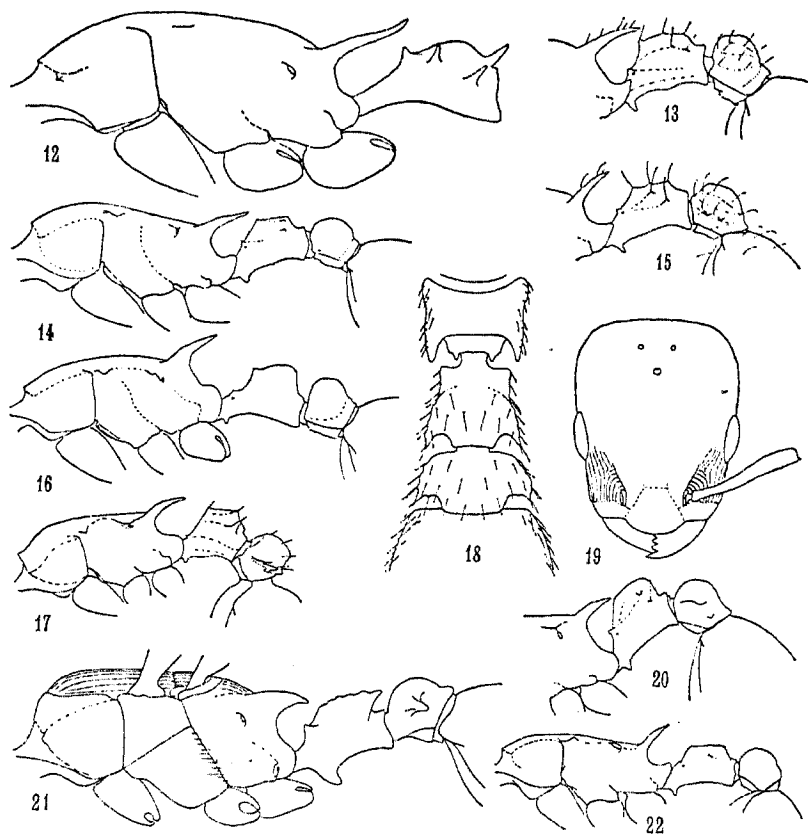
2. *Leptothorax* (*Nesomyrmex*) *anduzei* Weber

(Figs. 5, 12, 24)

Leptothorax (*Goniothorax*) *anduzei* Weber, 1943, Bol. Ent. Venezol. 2 : 72-74 (Worker; Venezuela: S. Esteban).

Types. — Several workers, taken on March 3, 1940 by P. J. Anduze in a bat cave, near San Esteban, Carabobo State, Venezuela. Syntypes in the collection of Dr. N. A. Weber, who kindly sent me on loan one specimen (lectotype).

Worker (lectotype). — Total length 5.2 mm; maximum length of head capsule 1.16 mm; maximum width of head behind eyes 1.09 mm; length of scape 1.05 mm; Weber's length of thorax 1.63 mm. Closely related to *pulcher*, also as regards the contrasting dark color of head and gaster, and the light color



Leptothorax (Nesomyrmex)

Fig. 12. *L. anduzei* Weber, worker: thorax in profile. — Fig. 13. *L. asper* Mayr, worker: pedicel in profile. — Fig. 14. *L. timidus* n. sp., worker: thorax in profile. — Fig. 15. *L. tristani* Emery, worker: pedicel in profile. — Fig. 16. *L. costatus* Emery, worker: thorax in profile. — Fig. 17. *L. spinodis* Mayr, worker, thorax in profile. — Fig. 18. *L. tonsuratus*, n. sp., female: epinotum and pedicel in dorsal view. — Fig. 19. *Idem*, female: head. — Fig. 20. *L. itinerans*, n. sp., worker: pedicel in profile. — Fig. 21. *L. tonsuratus*, n. sp., female: thorax and pedicel in profile. — Fig. 22. *L. pleuriticus* Wheeler, worker: thorax in profile.

of thorax and pedicel, with the following differential features: 1) Thorax and pedicel paler, light testaceous. Tegument intensely opaque and velvety in appearance. Microsculpture consisting of extremely fine and dense punctures, visible only at great magnification (100 ×). 2) Head (Fig. 24) shorter, with the cervical flange visible from above. 3) Thorax (Fig. 5) with longitudinal costae, which are more regular and scarcely vermiculate, also on sides. Mesonotum and base of epinotum without the laterally projecting subtriangular lobes. 4) Epinotal spines (Fig. 12) more delicate, somewhat longer; the finely drawn-out apex bent obliquely upward. 5) Antero-inferior corner

of pronotum (above coxae) forming a distinct angle. 6) Declivous face of epinotum lacking transverse striae. 7) Petiolar peduncle more constricted and longer. Spines of node better developed. Dorsum of node without longitudinal costae. 8) Postpetiole longer, with transverse rugae on posterior half; lateral spines preceded by two smaller ones. 9) Base of first gastric tergite with very fine, almost inconspicuous, but very dense longitudinal striae.

Observation. — The lectotype specimen has some slight teratological deformations apparent on the left side of the postpetiole and the base of gaster, the latter being very short.

A worker from an unknown locality in Colombia, taken on orchid *Cattleya gigas* (U. S. Plant Quarantine interception -USNM n. 41-15425) seems to belong to the same species. Its measurements are as follows: Total length 5.5 mm; maximum length of head capsule 1.26 mm; maximum width of head behind eyes 1.08 mm; length of scape 1.08 mm; Weber's length of thorax 1.74 mm. Following are its chief differences from the lectotype specimen:

The light-colored parts less pale, head and gaster likewise light; only funiculi, tibiae and tarsi with the contrasting dark-brown color. Head longer, costae of thorax slightly more vermiculate (not as much as in *pulcher!*). Dorsum of petiolar node with longitudinal costae. Postpetiole shorter and more transverse, with longitudinal rugosities and only one denticle in front of the lateral spine. Striae on basal half of first gastric tergite better visible.

Although this specimen approaches in several characters the condition obtained in *pulcher*, it agrees with *anduzei* in all more essential features, especially in the lack of thoracic constrictions and projections at the meso and epinotum, the delicate slender epinotal spine, and the shape of the petiole.

3. *Leptothorax* (*Nesomyrmex*) *sculptiventris* Mayr

- Leptothorax sculptiventris* Mayr, 1887, Verh. Zool.-bot. Ges. Wien, 37 : 620-621 (Worker; Brazil, Santa Catarina). — Wheeler, 1931, Bull. Mus. Comp. Zool. Harvard 72 : 30-31. — Kempf, 1958, An. Acad. Brasil. Cien. 30 : 97-98, Figs. 1, 2 (Worker; Brazil, Rio de Janeiro State: Petrópolis, Itatiaia).
Leptothorax sculptiventris var. *major* Forel, 1899, Biol. Centr. — Amer. Hym. 3 : 54, nota (Worker; Brazil, São Paulo State: Botucatu). — Nov. Syn.
Leptothorax sculptiventris var. *distincta* Crawley, 1922, Ent. Rec. Lond. 34 : 85-86 (Worker; "South America"). — Nov. Syn.
Leptothorax sculptiventris var. *borgmeieri* Wheeler, 1931, Bull. Mus. Comp. Zool. Harvard 72 : 30-31 (Worker; Brazil, Rio de Janeiro State: Petrópolis). — Nov. Syn.

Types. — Workers from an unknown locality in Santa Catarina State, southeastern Brazil, Hetschko leg., in the Mayr collection (NHMW). Two syntypes examined.

This species, of which only the worker is known, differs from the preceding *pulcher* and *anduzei* in having nearly rounded, edentate scapular corners of the thorax; dorso-laterally edentate, strongly convex, densely reticulate-rugose petiolar and post-

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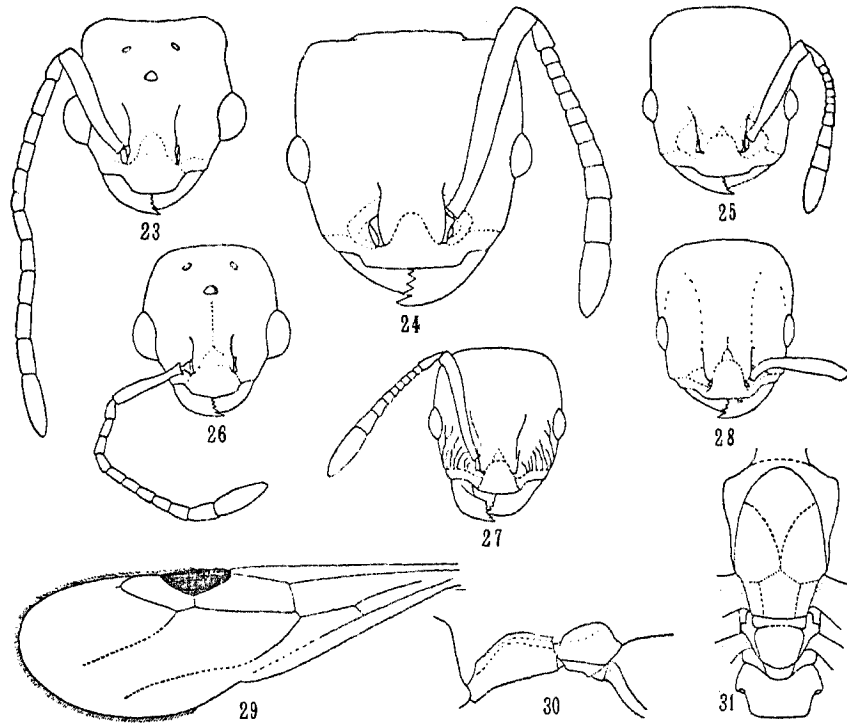
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This species, of which only the worker is known, differs from the preceding *pulcher* and *anduzei* in having nearly rounded, edentate scapular corners of the thorax; dorso-laterally edentate, strongly convex, densely reticulate-rugose petiolar and post-



Leptothorax (Nesomyrmex)

Fig. 23. *L. asper* Mayr, male: head. — Fig. 24. *L. anduzci* Weber, worker: head. — Fig. 25. *L. costatus* Emery, worker: head. — Fig. 26. *L. itinerans*, n. sp., male: head. — Fig. 27. *L. pleuriticus* Wheeler, worker: head. — Fig. 28. *L. wilda* M. R. Smith, worker: head. — Fig. 29. *L. itinerans*, n. sp., male: fore wing. — Fig. 30. *Idem*, male: pedicel in profile. — Fig. 31. *Idem*, male: thorax in dorsal view.

petiolar nodes; the apical half of first gastric tergite smooth and shining; the dorsum of thorax with weaker and more irregular rugosities.

Mayr's description of the types is excellent, except for the fact that even in the types the tip of the scape in repose at least attains the occipital margin. These specimens are of relatively small size and measure as follows: Total length 4.7 mm; maximum length of head capsule 1.16 mm; maximum width of head behind eyes 0.90 mm; Weber's length of thorax 1.45-1.52 mm; length of scape 0.98 mm.

The hitherto recognized varieties were established upon differences in size and color. Since probably less than a dozen specimens have been taken so far, the extent of individual variability within the species is unknown. To my mind, the varieties of *sculptiventris* deserve no taxonomic recognition and I have put them into synonymy.

When Forel (1899) proposed the var. *major*, he made much of the larger size, the slightly longer scape and funicular segments of his specimen. Although I have not seen this individual, I am sure that it

corresponds with the specimens of intermediate size from Petrópolis and Itatiaia, already registered in my preceding study (Kempf, 1958). At that time, I overlooked the fact that Wheeler (1931) had established upon the Petrópolis specimens a new var. *borgmeieri*. After examining a nido-type of this form I find that it is perfectly identical with var. *major* Forel. The latter, in turn, is nothing but a synonym of *sculptiventris*.

Crawley's var. *distincta* is indeed a very large *sculptiventris* worker, collected by Dr. Swale somewhere in "South America". The type, which is correctly diagnosed in the original description, was kindly forwarded for examination by Mr. E. Taylor (HDOX). It measures as follows: Total length 5.8 mm; maximum length of head capsule 1.34 mm; maximum width of head behind eyes 1.05 mm; length of scape 1.09 mm; Weber's length of thorax 1.77 mm. In spite of its large size and strongly contrasting color, this worker does not exhibit a single significant structural difference from the typical *sculptiventris* and must be assigned to synonymy of the latter. The origin of this specimen is still another problem, inasmuch as the collector (if identical with Dr. Harold Swale) appears to have collected in every part of the world, except South America. The original locality label (if there ever was one) doesn't exist any more. According to Mr. Taylor, to whom I owe this bit of information, the specimen could even have come from Samoa, where Swale spent a considerable period of time, and Crawley could have misunderstood the abbreviation "Sam." for "S. Am."

According to our present knowledge, *sculptiventris* seems to be confined to southeastern Brasil, having been recorded from the States of Santa Catarina, São Paulo and Rio de Janeiro. I have seen 5 specimens.

4. *Leptothorax* (*Nesomyrmex*) *costatus* Emery

(Figs. 4, 16, 25)

Leptothorax (*Goniothorax*) *costatus* Emery, 1896. Bull. Soc. Ent. Ital. 28 : 59-60
(Worker: Brazil: Rio Grande do Sul).

Type. — A single worker from the State of Rio Grande do Sul, Brazil, H. von Jhering leg. (presumably either at Taquara or São Lourenço), deposited in the Emery collection (MCSN). Holotype examined.

Worker (holotype). — Total length (with somewhat dilated gaster) 3.4 mm; maximum length of head capsule 0.80 mm; maximum width of head behind the eyes 0.67 mm; Weber's length of thorax 1.01 mm. Ferruginous-brown, gaster darker. Apical club of antennae infuscated.

Head (Fig. 25) capsule subrectangular with nearly straight lateral borders which are slightly converging cephalad, with rounded occipital corners and very feebly convex occipital border.

Mandibles longitudinally striate. Median lobe of clypeus somewhat projecting, extending backwards between the frontal carinae, separated from the front by a rather distinct suture, its anterior border feebly convex, nearly straight, its surface mostly smooth and shining, with a few vestigial longitudinal striae laterally and posteriorly, and with a stronger median longitudinal carinule. Frontal area triangular, impressed. Frontal carinae subparallel in front, slightly diverging behind, fading away at the level of the eyes. Antennae 12-segmented. Scape nearly smooth, with a gentle bend at the base and slightly incrassated toward apex. Funicular segments II-VIII not longer than broad; segments IX-XI forming the apical club, each segment definitely longer than broad, segment XI at least as long as the two preceding combined. Eyes small but rather convex, with about 11-12 facets across greatest diameter. Dorsal and gular face of head with rather widely spaced longitudinal costulae, their intervals finely but vestigially and superficially reticulate, highly shining. Costulae closer to each other and concentrically disposed around the antennal socket. Occipital corners almost smooth.

Thorax (Figs. 4, 16) dorsally nearly smooth, without micro-sculpture but with longitudinal, rather regular, very widely spaced costulae, about 7 on pronotum continuing backwards and fading away on basal face of epinotum. In profile, the dorsum of thorax forms an even, uninterrupted and gentle curvature. Dorsal face of pronotum slightly convex transversely, its anterior border carinate, the humeral angles conspicuously dentate, the lateral borders marginate, the posterior corners subrectangular. Lateral face of pronotum somewhat convex with vestigial curved costulae. Promesonotal suture vestigial. Sides of mesonotum anteriorly with a small acute tooth. Mesoepinotal suture absent. Basal face of epinotum having on each side a small tooth above and in front of the spiracle, strongly constricted toward the greatly approximated bases of the epinotal spines. The latter basally raised obliquely upward and laterad, then distally forming a distinct angle, becoming horizontal and depressed, pointing directly caudad; their apices pointed. Declivous face of epinotum smooth. Sides of thorax shining but with rather irregular and strong rugosities. Metasternal lobes rounded, lacking a dorsal angle or tooth. Legs smooth and shining.

Petiole (Figs. 4, 16) with a short peduncle in front; the node rather highly elevated, with a tooth anteriorly at its base on each side, a coarsely, more or less longitudinally costate

dorsum, the posterior face nearly vertical. Postpetiole transverse elliptical, with widely spaced, about 10 longitudinal costae, the intervals smooth and shining. Each side bearing 2-3 slightly prominent tiny setigerous tubercles. Gaster smooth and shining.

Standing hairs whitish, not quite stiff, occasionally rather flexuous, more or less pointed at apex, rather abundant on dorsal face of body and on gaster. Each epinotal spine with 5 standing or oblique hairs, petiolar node with 12 standing hairs. Short, sparse, appressed or decumbent hairs on mandibles, antennae and legs.

F e m a l e (undescribed). — Dealate. Total length 4.4 mm; maximum length of head capsule 0.92 mm; maximum width of head behind eyes 0.74 mm; Weber's length of thorax 1.37 mm. — Fuscous brown, gaster black. Similar to the worker, with the differences of the caste. Head and thorax, including the sides of the latter, with the same, rather widely spaced longitudinal costae, the intervals always with nearly effaced microsculpture, smooth and shining. Basal face of epinotum with strongly marginate, converging and concave lateral borders, angulate but only subdentate posterior corners, scarcely concave but submarginate posterior border, presenting 7 longitudinal costulae, including the carinules of the posterior half of the lateral borders. Sides of epinotum with a few vertical costulae. Declivous face of epinotum smooth and shining. Metasternal lobe rounded. First gastric tergite with numerous, fine dense yet superficial basidorsal costulae, not extending beyond anterior fifth of tergite. Pilosity as in worker; 12 standing setae on petiolar node.

D i s t r i b u t i o n. — The rarely collected species occurs in southeastern Brazil, having been recorded from the States of Rio Grande do Sul, Santa Catarina and São Paulo.

S p e c i m e n s e x a m i n e d. — 9 workers and 1 female, as follows: Brazil, Rio Grande do Sul State: (Taquara or São Lourenço?), H. von Jhering leg.: 1 worker (holotype) (MCSN). — Santa Catarina State, loc. unknown, Hetschko leg.: 1 worker ("vicinus var." Mayr det.) (NHMW); Blumenau, Jan. 1958, R. Mueller leg.: 1 worker (WWK). — São Paulo State: Barueri, 11-VI-1958 and 30-V-1959, K. Lenko leg.: 6 workers and 1 female (WWK, and coll. Lenko).

V a r i a t i o n. — The specimens from Blumenau and Barueri are much darker, nearly fuscous. In addition, the Blumenau worker has the dorsum of thorax nearly devoid of longitudinal costulae, the epinotal

spines more depressed and bluntly rounded at apex; hairs on the legs rather oblique than standing. Standing hairs on epinotal spines 4 or 5. Range of measurements of 9 workers examined: Total length 3.0-3.4 mm; maximum length of head capsule 0.74-0.82 mm; maximum width of head behind eyes 0.62-0.70 mm; Weber's length of thorax 0.87-1.01 mm.

Discussion. — Contrary to my previous surmise (Kempf, 1958), the examination of the holotype proved that this is a good species, differing from its sympatric closest relatives *vicinus* and *schwebeli* principally in the darker color, the more widely spaced longitudinal costulae and obsolete microsculpture of head and thorax, the more abundant standing hairs. Furthermore, the worker disagrees with *schwebeli* by the lack of longitudinal striae on the first gastric tergite, the more approximated and almost geniculate epinotal spines, the nearly smooth lateral face of the fore coxae; with *vicinus* by the rounded metasternal lobe, and the usually slightly more elongate head-capsule.

5. *Leptothorax (Nesomyrmex) vicinus* Mayr

Leptothorax vicinus Mayr, 1887, Verh. Zool. — bot. Ges. Wien 37 : 620 (Worker; Brazil: S. Catarina). — Emery, 1887, Bull. Soc. Ent. Ital. 19 : 353 (Brazil: Rio Grande do Sul). — v. Jhering, 1894, Berl. Ent. Zeitschr. 39 : 389 (Brazil: Rio Grande do Sul: São Lourenço). — ? Forel, 1912, Mém. Soc. Ent. Belg. 20 : 18 (Female; Brazil: S. Paulo). — Luederwaldt, 1926, Rev. Mus. Paul. 14 : 270 (Biol.). — Kempf, 1958, An. Acad. Brasil. Cien. 30 : 98-99, Figs. 3, 7, 15 (Worker; Brazil: Rio Grande do Sul: Pareci Novo; Paraná: Taquara; São Paulo: S. Roque, Agudos).
Leptothorax vicinus var. *testaceus* Emery, 1894, Bull. Soc. Ent. Ital. 26 : 164-165 (Worker; Brazil: Rio Grande do Sul: São Lourenço; Bolivia: Coroico, Chilumani-Yungas). Santschi, 1929, An. Soc. Cient. Argent. 107 : 301 (Argentina, Santiago del Estero; Icaño). — Nov. Syn.

Types. — Workers from an unidentified locality in Santa Catarina State, Brazil, Hetschko leg., deposited in the Mayr collection (NHMW). I have seen two syntype workers.

Worker. — This caste has already been discussed and figured in a preceding paper (Kempf, 1958). The interpretation of the species is confirmed by the examination of the syntype workers received from Vienna. The measurements of these two specimens are the following: Total length 3.1-3.4 mm; maximum length of head capsule 0.76-0.83 mm; maximum width of head behind eyes 0.67-0.71 mm; Weber's length of thorax 0.92-1.03 mm. The following distinguishing features permit separation from *costatus*, the next kin: 1) Metasternal lobe dorsally distinctly dentate. 2) Head and thorax heavily reticulate-punctate between the longitudinal costae, subopaque. 3) Costae on dorsum of thorax more numerous, at least 8 on pronotum; sides of thorax (except laterotergite of pronotum) practically without heavy rugae or costae, but sharply reticulate-punctate. 4) Epinotal spines less approximate at base, not distinctly geniculate at half the length. 5) Standing hairs slightly less abundant, 2-3

on epinotal spines, 8-10 on petiolar node. 6) Color always lighter, testaceous or light reddish-brown (gaster occasionally fuscous).

Female. — Forel (1912) doubtfully referred an isolated queen from Ipiranga, São Paulo, to this species. This caste is now definitely recognized in two dealate females, one from Pareci Novo, R. S. and the other from Barueri, S. P., which came associated with workers from the same nest. Measurements: Total length 4.5-4.7 mm; maximum length of head capsule, 0.92-0.96 mm; maximum width of head behind eyes 0.76-0.78 mm; Weber's length of thorax 1.45-1.48 mm. — The separatory characters that distinguish the female from that of *costatus* are the same as for workers, especially the following: Color testaceous or light reddish-brown. Metasternal lobe dorsally dentate. Intervals between costae of head and thorax heavily reticulate-punctate. Basal face of epinotum with longitudinal vermiculate rugae diverging caudad; posterior angles distinctly dentate; posterior border shallowly emarginate. Sides of thorax finely longitudinally rugose with rows of punctures in the interstices. First gastric tergite without basidorsal costulae, completely smooth and shining.

Distribution. — This seems to be one of the better known species of the genus, not uncommon in Southeastern Brazil, where it has been recorded from the States of São Paulo, Paraná, Santa Catarina and Rio Grande do Sul. In addition there are records from Santiago del Estero in the Argentine (*teste* Santschi, 1929) and from subandean Bolivia (*teste* Emery, 1894).

Synonymy. — The lighter color variant "*testacea*" does not deserve taxonomic recognition, since light and dark forms occur side by side at the same localities (*ex. gr.* in Barueri, S. P.). The light form seems to be more frequent.

New locality records. — Brazil, S. Catarina State: Nova Teutônia (F. Plaumann) (CTB); S. Paulo State: Barueri (K. Lenko) (WWK and Coll. Lenko).

Biology. — Luederwaldt (1926) reports a nest of this species found under a stone. Such a site seems rather strange, as all other indications, including my personal field experience, invariably show that *L. vicinus* nests in plant cavities, usually in hollow dead twigs. I suspect that Luederwaldt misidentified the specimens in question, which I have not found in the collection at the Departamento de Zoologia de São Paulo.

6. *Leptothorax (Nesomyrmex) schwebeli* Forel

Leptothorax schwebeli Forel, 1914, Bull. Soc. Vaud Sci. Nat. 49 : 216-217 (Worker; Brazil, São Paulo; Alto da Serra). Luederwaldt, 1926, Rev. Mus. Paul. 14 : 269 (Biol.). Kempf, 1958, An. Acad. Brasil. Cien. 30 : 26-97, Figs. 4, 8, 14 (Worker; Brazil, Rio Grande do Sul; Nova Petrópolis).

This species, of which only the worker is known, has already been dealt with critically in a previous study (Kempf, 1958). According to Luederwaldt (1926), the type series was found nesting in decaying wood. Syntypes are presumably in the Forel collection at Geneva, Switzerland. I have seen the nidotypes in the collections of the Departamento de Zoologia de São Paulo and of Father Borgmeier (CTB). No new records are available.

Leptothorax schwebeli is next to *vicinus*, differing principally in the rounded metasternal lobe and the finely longitudinally striate basal half of the first gastric tergite. The head is usually subtrapeziform i. e. slightly more constricted in front than behind. Dorsum of thorax with 9-10 longitudinal and somewhat vermiculate costae, having occasional cross-connections, especially on the mesonotum. Lateral borders of pronotum not margined by a sharp continuous crest, but by irregular and often traversing rugae. Epinotal spines, as a rule, more widely separated at base, very little curved, almost straight. Sculpture of coxae and post-petiole more pronounced. Color testaceous.

7. *Leptothorax (Nesomyrmex) itinerans*, n. sp.

(Figs. 2, 20, 26, 29, 30, 31)

Worker (holotype). — Total length 3.2 mm; maximum length of head capsule 0.76 mm; maximum width of head behind eyes 0.66 mm; Weber's length of thorax 0.98 mm. Testaceous; chewing border of mandibles and apical club of funiculus fuscous; gaster piceous.

Head capsule subrectangular; sides straight, somewhat converging anteriorly; occipital corners rounded; occipital border almost straight, scarcely convex. Mandibles with weak to vestigial longitudinal striae (striation effect produced by longitudinally drawn-out setigerous pits). Median lobe of clypeus anteriorly somewhat projecting and gently convex; its surface finely and more superficially reticulate-punctate, lacking distinct longitudinal costae and carinules. Frontal area triangular, impressed. Frontal carinae parallel, fading away at the level of eyes. Antennae 12-segmented; scape nearly smooth with a

gentle bend at the base, gradually thickening toward apex; funicular segments III-VII rather broader than long, II and VIII about as broad as long, remaining segments longer than broad, IX-XI forming the apical club, segment XI as long as IX and X combined. Eyes relatively small with about 10 facets in a row across the greatest diameter. Head above and below densely and finely reticulate-punctate and opaque; with sparser, mostly longitudinal yet frequently anastomosing rugulae, in the interstices frequent yet only vestigial and shallow larger foveolae. Concentric costulae or rugae around antennal socket absent.

Thorax (Fig. 2) opaque, finely reticulate-punctate. Dorsum in profile gently and evenly convex, covered with fine, mostly longitudinal, vermiculate or anastomosing rugulae, becoming obsolete on posterior half of mesonotum and epinotum. About 12 rugae on dorsum of pronotum, which is gently convex transversely, anteriorly marginate to subcarinate, laterally submarginate, lacking a continuous costa or a sharp edge at each border. Shoulders angulate but rather feebly dentate. Promesonotal suture obsolete. Mesonotum laterally submarginate, lacking a sharp lateral tooth, having instead a rounded, scarcely prominent postero-lateral corner. Mesoepinotal suture absent. Basal face of epinotum antero-laterally expanded into a triangular lobe above the spiracle, then somewhat constricted in front of the epinotal spines. These are well separated from each other at base, scarcely raised toward apex and little curved but somewhat divergent. Posterior border of basal face, between the spines, immarginate. Metasternal lobes dorsally rounded. Coxae opaque and more strongly, rest of legs superficially sculptured and somewhat shining.

Petiole (Figs. 2, 20) with a short anterior peduncle, an oblique, not concave ascending face forming an angle with the summit of node. Posterior face perpendicular. A midventral tooth on peduncle, a stronger tooth anteriorly on each side at the base of the node, 4 setigerous denticles at each side dorsally, dorzolaterally, laterally and posteriorly on the node. Postpetiole broad oval, twice as broad as long, strongly convex in profile. Both pedicelar segments opaque, finely and densely reticulate-punctate, dorsally with fine mostly longitudinal rugosities.

Gaster smooth and shining. Basal half and border of first tergite very finely and superficially reticulate.

Standing hairs yellowish-white, short, apically obtuse, of equal length throughout (not longer on thorax and pedicel),

sparsely distributed over clypeus, dorsum of head, thorax, petiole postpetiole and dorsally and ventrally on gaster; lacking on epinotal spines; slightly pointed on gaster. Scape and legs with minute, sparse, appressed hairs. Gular face of head with slightly longer decumbent hairs.

Paratype workers (5 specimens). — Total length 3.2-3.3 mm; maximum length of head capsule 0.75-0.80 mm; maximum width of head behind eyes 0.66-0.67 mm; Weber's length of thorax 0.96-1.01 mm. Exactly as holotype, but some specimens are more deeply yellowish-brown instead of pale-testaceous.

Female (paratypes). — Total length 4.3-4.4 mm; maximum length of head capsule 0.89-0.94 mm; maximum width of head 0.75-0.76 mm; Weber's length of thorax 1.34-1.36 mm. Differential characters, color, sculpture and pilosity as in worker. Pronotum transversely rugose, scutum and scutellum more heavily longitudinally convex, sides and posterior border immarginate, epinotal spines conical and pointed, well developed, about half as long as basal face. Metasternal lobe rounded. Setigerous tubercles of petiole more prominent. Wings unknown.

Male (USNM 41-2763). — Total length 3.8 mm; maximum length of head capsule 0.71 mm; maximum width of head behind eyes 0.62 mm; Weber's length of thorax 1.27 mm. Brown; head capsule fuscous. Mandibles smooth and shining, with a few elongate setigerous grooves toward apex; chewing border with 5 pointed teeth, gradually increasing in size toward apex. Median lobe of clypeus very prominent, with about seven fine longitudinal rugae. Rest of head capsule opaque, finely yet sharply reticulate-punctate with sparser and rather irregular fine rugulae. Eyes (Fig. 26) large, bulging, their maximum diameter exceeding one third of head length (14:40). Palpal segments 5:3. Antennae 12-segmented. Scape as long as segment I-IV of funiculus combined. None of the funicular segments shows a striking increase in size or a constriction at the middle to indicate fusion of two segments. Occiput rounded. Thorax more lightly reticulate-punctate, subopaque. Sides of pronotum and parapsides of scutum only vestigially sculptured and quite shining. Pronotum (Fig. 31) with angulate shoulders, marginate lateral borders. Mesonotum anteriorly vaulted, scutum almost twice as long as broad, anterior two thirds strongly convex with conspicuous Mayrian furrows, posterior third depressed, divided into three parts by two longitudinal sulci (notaulices?); Epinotum posteriorly rounded, lacking teeth or spines, but

lateral spiracle situated on prominent tubercle. Metasternal lobes rounded. Petiole subclavate (Fig. 30), node dorsally flattened, dorso-laterally with a few longitudinal rugulae. Post-petiole oval, little broader than long. Gaster subopaque, finely reticulate. Standing hairs abundant on ventral face of head and coxae, scarce on mesonotum, and apical segments of gaster, elsewhere practically lacking. Apressed hairs conspicuous yet sparse on dorsum of head and on first gastric tergite. Wings very little infuscated, veins light brown, stigma darker. Venation of fore wing shown on Fig. 29.

Specimens examined: 7 workers, 4 females and 1 male, all taken on orchids (*Cattleya* sp.) at Hoboken, N. J., imported from Venezuela (U. S. Plant Quarantine interception), belonging to two series. 6 workers and 3 females (holotypes and paratypes) collected on May 12, 1954 (USNM n. 54-6513); 1 worker, 1 female, 1 male, taken on February 21, 1941 (USNM n. 41-2763). The latter specimens are not considered types, inasmuch as the worker and female, otherwise completely identical with the types, have the gaster not piceous, but yellowish-brown as the rest of the body. Two paratype workers and 1 paratype female are deposited in my collection (WWK).

Discussion. — The present species is related with both *pittieri* and *schwebeli*. The worker differs from the former in having the scape only gently bent at base, the head longitudinally rugose and only indistinctly foveolate, the clypeus without a strong median carinule; the pronotal humeri only feebly angulate; the thoracic dorsum more weakly rugose; the base of the first gastric tergite slightly and superficially reticulate.

The following characters separate the worker of *itinerans* from *schwebeli*: Mandibles and clypeus not distinctly striate or costate; head and dorsum of thorax not coarsely and sharply costate but only rugose, the rugae occasionally anastomosing, with vestigial foveolae in the intervals on head; scapular angle and mesonotum laterally not sharply dentate; depression around antennal socket lacking concentric rugae; gaster lacking fine longitudinal striae on base of first tergite; standing hairs always shorter, not longer than greatest thickness of epinotal spines, more obtuse, of equal length throughout, lacking completely on epinotal spines.

The female is closest to *pittieri*, the differences will be given under that species. This sex is not known of *schwebeli*.

The above diagnosed male has been given only a cursory treatment, inasmuch as this sex is too little known, and the important characters have not been worked out as yet. It is rather striking that the male of this species, having a worker with 12-segmented antennae possesses the same number of segments, whereas the male of *asper* and *spininodis*, the worker of which has 11-segmented antennae, has also 12-antennal segments, with 13 segments often indicated by one indistinctly fused segment of the funiculus. Whether this character is good for separating the two large species groups of workers remains to be seen.

8. *Leptothorax (Nesomyrmex) pittieri* Forel

Leptothorax pittieri Forel, 1899, Biol. Centr.-Amer. Hym. 3 : 56 (Worker; Costa Rica).
Kempf, 1958, An. Acad. Brasil. Cien. 30 : 95-96, Figs. 6, 9, 17, 19, 22, 23
(Worker; Panama C. Z.; Frijoles; Costa Rica, Santa Clara; Hamburg Farm).

Type. — One (?) worker, collected by H. Pittier at an unidentified locality in Costa Rica, presumably deposited in the Forel collection at Geneva, Switzerland. Not seen.

This species is quite close to the preceding *itinerans*, but may be readily distinguished by the following characters:

Worker. — Scape basally strongly curved. Clypeus with a prominent median longitudinal carina. Integument of head covered with larger shallow foveolae, lacking completely longitudinal rugae or costae. Costae of dorsum of thorax and pedicelar segments more prominent, coarser. Femora contrastingly colored: tips light yellowish-brown, belly fuscous. Anterior face of petiole in profile at least somewhat concave.

Female (undescribed). — Total length 4.0-4.2 mm; maximum length of head capsule 0.83-0.85 mm; maximum width of head behind eyes 0.69-0.71 mm; Weber's length of thorax 1.25-1.33 mm. Except for the peculiarities of the caste, quite similar to the worker, with the same differences from *itinerans*. In addition the epinotal spines are very short, much shorter than half the length of the basal face of epinotum. Wings slightly tinted with yellow, veins light brown. Radial cell short and closed, shortly appendiculate; discoidal cell absent.

New locality records. — Mexico, Vera Cruz: Las Hamacas, 17 km N. of Santiago Tuxtla, Aug. 26-28, E. O. Wilson leg.: 2 workers (strays) (MCZ, WWK). — Costa Rica: La Lola, July 12, 1956, N. A. Weber leg.: 1 Worker (WWK, received from Dr. Weber); Costa Rica, exact locality unknown (U. S. Plant Quarantine interception at San Francisco, Cal., on imported orchids) on *Cattleya skinneri*, May 3, 1936: 4 workers (USNM n. 36-5329), on *Cattleya dowiana*, December 27, 1935: 4 workers, 5 females (USNM n. 35-24108) and November 8, 1945: 2 workers (USNM n. 45-19709) (USNM, WWK).

One of the Mexican specimens from Las Hamacas is a gynecoid, bearing at each side of the mesonotum a small wingstub. The differences as regards the configuration of the petiole, pointed out in a preceding paper (Kempf, 1958) fall within intra-specific variability and do not seem to be of taxonomic significance. Some of the new specimens mentioned in this study apparently bridge the gap.

9. *Leptothorax (Nesomyrmex) brasiliensis* Kempf

Leptothorax brasiliensis Kempf, 1958, An. Acad. Brasil. Cien. 30 : 92-94, Figs. 10, 18, 21 (Worker, female; Brazil, Pernambuco: Caruaru).

The present species is still known only from type material, workers and female, in my collection (WWK, received from CTB n. 3187).

The small size, the pale testaceous color, the lack of rugae and distinct foveolae on the cephalic dorsum distinguish the worker and the female of *brasiliensis* from all other species with 12 antennal segments. The peculiar shape of the thorax in the worker reminds that of *wilda*, but the latter has only 11 antennal segments, is of conspicuously larger size and exhibits longitudinal rugosities on the cephalic and thoracic dorsum.

10. *Lep'othorax (Nesomyrmex) tonsuratus*, n. sp.

(Figs. 18, 19, 21)

F e m a l e (holotype). — Total length 4.6 mm; maximum length of head capsule 1.04 mm; maximum width of head behind eyes 0.81 mm; length of scape 0.53 mm; Weber's length of thorax 1.25 mm. Fuscous-brown to black; mandibles and tarsi dark yellowish-brown. Integument of body and appendages practically without microsculpture, smooth and shining.

Head (Fig. 19) elongate, subrectangular; dorsum strongly convex transversely; sides straight, feebly converging cephalad; occipital angles broadly rounded; occipital border nearly straight. Median lobe of clypeus longitudinally convex, lacking striae, rugae and costae; its anterior border arched, its posterior border vestigial. Frontal area obsolete. Frontal carinae very short, anteriorly subparallel, then obliquely bent laterad, fading out above the conspicuously flattened eyes. Cheeks costate, the mesal costae forming concentric arches around antennal socket, the lateral costae straight, continuing backwards above and below eyes, where they fade away. Antennae 12-segmented. Funicular segments III-VI rather broader than long; remaining segments longer than broad, segments IX-XI forming the apical club; segment XI as long as IX and X combined. Ocelli small, disposed in an equilateral triangle on vertex.

Pronotum (Fig. 21) with angulate yet not dentate humeri; lateral borders submarginate; dorsal face with a few inconspicuous rugae arching around the promesonotal border. Scutum and scutellum of mesonotum and basal face of epinotum finely longitudinally costate, the intervals smooth and shining. Basal face (Fig. 18) of epinotum slightly lobed antero-laterally, sides straight, subparallel, immarginate; epinotal spines strong, their outer borders subparallel, their apices pointed, more than half as long as basal face of epinotum. Metasternal lobe rounded, lacking a dorsal tooth.

Pedicelar segments of curious shape as shown on Figs. 18, 21. Petiole abruptly and strongly expanded laterad behind short peduncle, anterior corner of broadened portion rectangular. Node proper crescent-shaped, each side with a prominent and strongly recurved horn, which is dorso-laterally marginate and somewhat crenate. Dorsum of body of node flattened to gently excavate in the middle. Anterior peduncle with a strong midventral tooth. Postpetiole transverse, the sides prolonged into a stout, recurved conical spine. Gaster elongate-oval, anteriorly subtruncate, the first tergite distinctly longer than broad.

Standing hairs whitish, rather stiff and obtuse at tip, abundant and evenly scattered over the entire insect; short on head and mandibles; longer on thoracic dorsum but lacking completely on disc of basal face, on sides of thorax, and on declivous face; still longer along anterior and lateral margins of first gastric tergite and on remaining tergites and sternites. Shorter, oblique to decumbent hairs sparsely on legs and scapes. Minute, sparse and appressed hairs on dorsum of pedicelar segments (not shown in fig. 18) and on disc of first gastric tergite, which lacks standing hairs.

Worker and male. — Unknown.

Types. — Mexico, Puebla State: Huachinango, on bamboo poles (U. S. Plant Quarantine interception at El Paso, Texas, Febr. 7, 1945): 1 female (holotype; USNM n. 45-3156). — Mexico, on orchids (locality unknown; Plant Quarantine interception at Brownsville, Texas, Dec. 10, 1956): 1 female (paratype, WWK from USNM). — Brazil, State of Rio de Janeiro; Pôrto das Caixas, March 1928, O. Conde leg.: 1 female (paratype; WWK from CTB n. 3671). — Both paratypes are only fragments; the Mexican specimen lacks the head, the Brazilian individual the thorax.

Discussion. — The description of isolated females is generally discouraged in ant taxonomy. In the present case, due to the peculiar configuration of the pedicelar segments, an exception to this rule seems fully justified. Unless this species disagrees with all the other members of the group, the still unknown worker should have the same striking features.

Also the pilosity of the first gastric tergite is peculiar. Erect and suberect hairs fringe the shorn disc anteriorly and laterally, whereas the disc itself has only minute appressed setulae. On account of this shorn aspect of the gastric dorsum, I have given the species the name of *tonsuratus*.

11. *Leptothorax (Nesomyrmex) asper* Mayr

(Figs. 7, 13, 23)

Leptothorax asper Mayr, 1887, Verh. Zool. -- bot. Ges. Wien 37 : 618-620 (Worker, female, male; Brazil: S. Catarina). -- Emery, 1896, Bull. Soc. Ent. Ital. 28 : 59 (Key). -- Kusnezov, 1953, Fol. Univ. Cochabamba 6 : 107 (Worker, palpi). -- Kempf, 1958, An. Acad. Brasil. Cien. 30 : 90-91, Figs. 5, 12, 13 (Worker; Brazil: S. Catarina, Gaspar; Paraná: Arapongas; São Paulo: Agudos, Ribeirão Preto; Rio de Janeiro: Porto das Caixas; Distrito Federal: Jacarepaguá).
Leptothorax asper var. *rufa* Emery, 1896, Bull. Soc. Ent. Ital. 28 : 61 (Worker, female; Brazil: Pará). -- Nov. Syn.
Leptothorax asper var. *sulfurea* Forel, 1912, Mem. Soc. Ent. Belg. 20 : 18 (Worker; Brazil). -- Nov. Syn.

Types. -- Workers, females and males collected by Hetschko at an unidentified locality in S. Catarina State, Brazil, deposited in the Mayr collection (NHMW). I have seen 6 workers and 2 females, all syntypes of the typical *asper*, none of the varieties *rufa* and *sulfurea*.

The original diagnoses by Mayr are sufficiently detailed except for the omission of two taxonomically very significant characters of workers and females: the sculpture of the inner half of the mandibular dorsum and the shape of the metasternal lobes. Following are the measurements of the type specimens examined and the main distinguishing features for each caste of the species.

Worker. -- Total length 3.3-4.0 mm; maximum length of head capsule 0.81-0.95 mm; maximum width of head behind eyes 0.74-0.85 mm; length of scape 0.64-0.74 mm; Weber's length of thorax 0.92-1.17 mm.

Mandibles longitudinally striate on apex and along outer margin, finely reticulate and subopaque along inner margin. Eyes conspicuously convex. Scape in repose attaining the occipital margin. Head, thorax and pedicel coarsely sculptured; head dorsally longitudinally rugose, laterally reticulate-rugose; dorsum of thorax vermiculate or reticulate-rugose; sides of thorax irregularly rugose. Mesonotum gently transversely convex, sides subparallel, unarmed, scarcely convex. Epinotal (Fig. 7) spines long, slender, gently raised and little diverging toward apex. Metasternal lobe (Fig. 13) postero-dorsally produced and drawn out to a point. Petiole elongate; node with only one larger prominent dorso-lateral tooth at each side. Postpetiole lacking at each side a pair of prominent teeth. First gastric tergite usually distinctly longer than broad. Standing hairs abundant, also on scapes and legs. About 10 erect hairs arising from prominent tubercles on petiolar node. Hairs on dorsum of thorax longer than their distance from each other. Gaster also with sparse, minute, appressed setae.

Female. — Total length 4.7-5.4 mm; maximum length of head capsule 0.97-1.02 mm; maximum width of head behind eyes 0.83-0.90 mm; length of scape 0.73-0.79 mm; Weber's length of thorax 1.42-1.73 mm. Has the same differential characters as the worker, principally the sculpture of the mandibles and the postero-dorsally drawn-out metasternal lobes. Epinotal spines short and conical, somewhat shorter than half the length of the basal face.

Male. — Standing hairs abundant, present also on scapes and legs. Mandibles sculptured as in worker and female. Antennae with 12-13 segments, segments VI-VII usually partly ankylosed or fused together. Mayrian furrows of scutum not meeting each other posteriorly, but ending at a usually well developed transverse furrow, bisecting the scutum in two halves; posterior half of scutum, at the scutellar border, with a median variably developed, usually conspicuously raised tuberosity. Metasternal lobes completely rounded, not dentate nor pointed dorsally.

Distribution. — This is one of the commoner species of the genus. It occurs in cisandean South America from northern Argentina (*teste* Kusnezov, personal communication) to northern Venezuela. Here its range seems to overlap that of *tristani*.

New locality records. — Venezuela (Plant Quarantine interceptions on imported orchids at U. S. sea ports, 4 series) a) on *Cattleya* pseudobulb, Nov. 2, 1945: 9 workers and 1 female (USNM 45-19308; WWK); b) from Caracas, on *Cattleya mossiae* pseudobulb, Febr. 4-6, 1947: 13 workers, 1 female, 4 males (USNM n. 47-4783, WWK); c) on *Cattleya*, May 16, 1946: 1 worker (USNM 46-6165); d) on *Cattleya* foliage, August 18, 1938: 2 females, 1 male (USNM n. 38-1204). — Brazil, Pará State: Capanema, January 9, 1949, C. R. Gonçalves leg., 1 worker (CTB); São Paulo State: Guaratinguetá, November 15, 1958, W. W. Kempf, in cavities of a guava shrub: 50 workers (WWK).

Synonymy. — This species is highly variable, and so far all attempts to press this variability into a system have not reached a satisfactory conclusion. The varieties *rufa* and *sulfurea* seemingly do not represent circumscribable populations and are best placed into synonymy.

12. *Leptothorax* (*Nesomyrmex*) *tristani* Emery

(Figs. 11, 15)

Leptothorax tristani Emery, 1896, Bull. Soc. Ent. Ital. 28 : 61-62 (Worker, female; Costa Rica: Jimenez; Peru: Inanlué). — Weber, 1918, Naturw. Stud. Suriname en Curaçao 5 : 82 (Venezuela: Isla de Margarita; Trinidad: Gasparée Island).
Leptothorax asper var. *antoniensis* Forel, 1912, Mém. Soc. Ent. Belg. 20 : 18 (Worker; Colombia: Sierra Nevada de S. Marta, San Antonio). — Nov. Syn.
Leptothorax asper Mayr (Part.), Kempt, 1958, An. Acad. Brasil. Cien. 30 : 100 (Worker; Panamá, C. Z.: Corozal; Colombia: Sevilla).

Types. — Workers and one female from Jiménez, Costa Rica, collected by A. Alfaro, deposited in the Emery collection (MCSN). Emery mentions also an isolated worker from Inanfué, Eastern Peru, as belonging to the same species. The type locality is herewith restricted to Jiménez in Costa Rica.

The female syntype received on loan from the Emery collection proved that both Wheeler (material thus identified in the MCZ) and Weber (1948) correctly interpreted this species. It also confirmed my previous surmise (Kempf, 1958) that *tristani* is indeed extremely close to the widely distributed and highly variable *asper*. As a matter of fact, the validity of *tristani* as an independent species is now extremely doubtful. Only the fact that the present species has so far been scarcely collected and that both *asper* and *tristani* occur side by side in Caracas, Venezuela, prevent me from placing the latter into synonymy of the former.

The ensemble of the following characters should prove helpful in separating the worker of *tristani* from that of *asper*: 1) Longitudinal rugae on cephalic dorsum regular, more widely spaced, often fading out to a variable degree on front, vertex and occiput. 2) Rugae of thoracic dorsum usually less strikingly vermiculate, obsolescent on basal face of epinotum. 3) Epinotal spines (Figs. 11, 15) shorter, more elevated and more diverging toward apex. 4) Petiolar node, as seen from the side, more depressed; broader, with sides diverging caudad, when seen from above. Each side postero-laterally with at least two prominent teeth. 5) Postpetiole (Fig. 11) laterally with two prominent teeth. 6) First gastric tergite generally distinctly transverse, broader than long.

The distinguishing features for the female have not been worked out.

The accompanying figures are based upon individuals from Monos Island, Trinidad, which differ from the remaining specimens examined in the more obtusely dentate anterior basal angle of the petiolar node (Fig. 11) this angle being acuminate in all other workers of *tristani* examined during the present investigation.

New locality records. — Venezuela: Caracas, on *Cattleya mossiae* pseudobulb (U. S. Plant Quarantine interception at San Francisco, Cal.): 1 worker (USNM n. 47-4789, now in WWK); Yacua, H. A. Beatty leg. 1 worker (USNM). — Trinidad: Porto of Spain, Whelpley leg.: 1 worker (MCZ); Monos Island, Gulf of Paria (N. A. Weber leg.: 2 workers (WWK, from Coll. Weber). — Colombia: Rio Frio, Magdalena River, P. J. Darlington leg.: 1 worker (WWK, from MCZ).

Synonymy. — For geographical reasons and also on account of the shorter and more strongly raised epinotal spines I place the variety *antoniensis* into synonymy of the present form rather than of *asper*.

13. *Leptothorax* (*Nesomyrmex*) *pleuriticus* Wheeler, nov. stat.

(Figs. 3, 22, 27)

Leptothorax (*Goniothorax*) *echinatinodis aculeatinodis* var. *pleuriticus* Wheeler, 1921, *Zoologica* 3 : 158-160 (Worker, female, male; British Guiana: Kartabo).

Types. — Workers, females and males belonging to a single colony inhabiting the petiole of a young *Tachigalia* at Kartabo, British Guiana, collected by Wm. M. Wheeler, Sept. 3, 1920, n. 751 (MCZ type n. 22-406). I have seen three workers and two females, one specimen of each caste retained for my collection (WWK).

Worker (syntypes). — Total length 2.8-2.9 mm; maximum length of head capsule 0.66-0.71 mm; maximum width of head behind eyes 0.58-0.60 mm; Weber's length of thorax 0.79-0.83 mm. Brown: head, mesopleura, sides of epinotum, femora, apical funicular segments, chewing border of mandibles, gaster; light yellowish-brown: mandibles, antennae, remainder of thorax, coxae, base of femora, petiole and postpetiole; ivory: tibiae and tarsi.

Head (Fig. 27) capsule with gently curved sides, bluntly rounded occipital corners, slightly convex occipital border. Mandibles shining, vestigially striate on apical half. Median lobe of clypeus anteriorly prominent, smooth and shining, with a feeble carinule at each side and a vestigial median longitudinal carinule on the anterior half. Posterior clypeal suture distinct. Frontal area triangular, impressed, finely but rather superficially punctate. Frontal carinae subparallel in front, prolonged and diverging caudad as a carinule, fading out at the level of the posterior orbit of the eyes. Antennae smooth and shining, attenuate at base, gradually and gently thickened toward apex, its tip attaining the occipital border when in repose. Funicular segment I, VIII and IX slightly less than twice as long as broad, II and VII somewhat longer than broad, III-VI about as long as broad, X longer than VIII and IX combined. Eyes moderately convex, situated approximately at the middle of the sides of the head. Head capsule mostly smooth and shining. Cheeks with

widely spaced rugae, most of them concentrically disposed around the antennal sockets. Intervals between the rugae vestigially reticulate-punctate. Gular face smooth and shining in the middle.

Thorax (Figs. 3, 22) subopaque; dorsum finely and sides more coarsely punctate. Pronotum with the anterior border straight, sharply carinate; shoulders angulate and dentate; the lateral borders gently convex and sharply marginate. Mesonotum flat, each side with a prominent small tooth. Epinotal spiracles situated rather dorsally than laterally. Epinotal spines long, slender, gradually tapering, directed obliquely laterad and upward at base, the apices less diverging. Metasternal lobes postero-dorsally produced and subangular. Dorsum of thorax with coarse longitudinal rugosities, frequently anastomosing transversely, about 6-7 on pronotum, 2-4 on mesonotum, only 2 on basal face of epinotum. Mesopleura sharply and coarsely reticulate-punctate, without coarse rugosities. Legs smooth and shining.

Petiole shortly pedunculate, with an elongate, dorsally more or less flattened node. Dorsal face with predominantly longitudinal costae, sides at the posterior third with a small prominent denticle. Anterior midventral tooth present. Postpetiole somewhat broader than long, its dorsum longitudinally rugose, the lateral rugae converging posteriorly mesad and fused with the respective rugae of the opposite side. Gaster smooth and shining.

Pubescence always sparse, decumbent on legs, and scapes, appressed on gaster, elsewhere practically absent. Standing hairs abundant, long, somewhat flexuous, especially on thorax, pedicel and gaster, also present on scapes and on legs.

Female (syntypes). — Total length 3.5-3.6 mm; maximum length of head capsule 0.73-0.78 mm; maximum width of head behind eyes 0.60-0.62 mm; Weber's length of thorax 1.08-1.10 mm. Pilosity and color as in worker, but the occipital corners are paler, yellowish-brown. Head slightly more elongate, more extensively sculptured, i. e. only the space between frontal carinas and its posterior prolongation on vertex are smooth and shining, the rest loosely and longitudinally costate-rugose, the intervals finely reticulate. Thorax subopaque, rugose and finely reticulate. Scutum and scutellum regularly and longitudinally rugose, the sculpture fading out anteriorly on the scutum which is almost smooth and shining. Basal face of epinotum reticulate-rugose, with a short, stout tooth on each posterior corner. Declivous face reticulate-punctate and faintly

transversely rugose. Mesopleura partly smooth and shining. Dorsum of postpetiole with concentric semicircular rugosities, their curvature facing caudad. Wings hyaline, veins pale yellow, pterostigma yellowish-brown. Fore wing with one closed marginal, one cubital and no discoidal cell.

Male. — This sex has been diagnosed by Wheeler (1921). I have not seen any specimens.

Discussion. — The type specimens received from the Museum of Comparative Zoology convinced me immediately that the present form bears no close relationship with *echinatinodis*, but represents a good independent species. Indeed, the longer scape, the standing hairs on scapes and legs, the postero-dorsally produced metasternal lobe, the scarcely spinulose, elongate petiolar node, the lack of microsculpture on the base of the gaster, the somewhat longer funicular segments III and VI, constitute a set of characters that remove the worker and the female of *pleuriticus* quite strikingly from *echinatinodis* and its "race" *aculeatinodis*. The same combination of characters places it in the vicinity of *asper* and *tristani*.

Workers and females of *pleuriticus*, however, differ from *asper* and *tristani* in smaller size, in the lack of fine reticulation on the inner half of the upper face of the mandibles, in the smooth and shining median lobe of the clypeus, in the less strongly convex eyes, in the more obtuse and rounded angle of the metasternal lobes, in the weaker sculpture (especially on sides of thorax) and in the somewhat longer standing hairs.

Note. — With some hesitation, I provisionally associate with the present species a series of 13 workers and 1 female from Colombia, captured on imported *Cattleya* orchids at San Francisco, Cal., February 15, 1940 (U. S. Plant Quarantine interception, USNM n. 40-3209).

The workers are uniformly fuscous-brown, with mandibles and legs somewhat lighter. The striae on the mandibles are stronger. Clypeus without a faint median carinule. Occipital margin more convex. Thorax quite shining, especially above, where the microsculpture is obsolete; instead of anastomosing rugae, there are quite regular longitudinal costae, about 8 on pronotum. Epinotal spines shorter, straighter, uniformly diverging caudad.

The female is likewise dark and has the thorax quite shining with strongly reduced microsculpture between the costae and rugae. Posterior corners of basal face of epinotum only vestigially dentate.

It is possible that this series represents a not yet recognized new species. But due to its close similarity to *pleuriticus*, I decided to postpone its formal proposition until we know more about the variability of *pleuriticus*.

Further locality record. — After completion of the manuscript, I received a stray alate female of this same species, from Cachoeira Tatu, Rio Amapari, Amapá Territory, Brazil, collected on June 22, 1959, by J. Lane and Bicelli.

14. *Leptothorax (Nesomyrmex) timidus*, n. sp.

(Figs. 10, 14)

Worker (holotype). — Total length 3.4 mm; maximum length of head capsule 0.83 mm; maximum width of head behind eyes 0.73 mm; length of scape 0.64 mm; Weber's length of thorax 1.03 mm. Yellowish-brown; chewing border of mandibles, antennal funiculi and tip of femora dark brown.

Head capsule with nearly straight sides, slightly converging cephalad, broadly rounded occipital corners, scarcely convex occipital border. Mandibles longitudinally striate. Median lobe of clypeus prominent, smooth and shining, with a weak median longitudinal carinule and 1-2 vestigial costae at each side. Posterior clypeal suture distinct. Frontal area subtriangular, impressed, finely reticulate-punctate. Frontal carinae short, subparallel. Antennae 11-segmented. Scape very finely reticulate, subopaque, attenuate at base, gradually and gently thickening toward apex, its tip approximately attaining the occipital margin when in repose. Funicular segments I, VIII-X much longer than broad, II and VII somewhat longer than broad, III-VI about as long as broad. Three-segmented apical club of the usual pattern. Eyes gently convex, situated slightly in front of middle of the sides of head. Dorsum and sides of head opaque, finely and densely reticulate-punctate, with sparse, delicate longitudinal rugae, which are quite regular on front and vertex, less regular laterally, concentrically arched around antennal socket. Gular face smooth and shining.

Thorax (Figs. 10, 14) opaque, reticulate-punctate throughout, densely and finely on dorsum, more coarsely on the sides. Humeri angulate, not dentate. Pronotum anteriorly and laterally not sharply marginate, gently transversely convex. Mesonotum slightly flatter, each side with a little prominent obtuse tooth. Basal face of epinotum anteriorly with a prominent triangular lobe at each side, containing the large spiracle, the latter facing obliquely laterad and upward. Epinotal spines rather long, slender, pointed and gently raised at apex, straight, distinctly diverging from each other. Dorsum of thorax with very sparse, rather irregular rugosities, mainly longitudinal but with frequent transverse connection, fading out posteriorly on mesonotum, lacking completely on basal face. Sides of thorax without rugosities. Metasternal lobe postero-dorsally produced but apex rounded. Legs faintly reticulate, coxae and belly of femora shining.

Petiole and postpetiole (Figs. 10, 14) more superficially reticulate-punctate, subopaque. Petiole with short anterior peduncle, base of node anteriorly with a prominent tooth at each side; anterior face in profile oblique, straight; dorsum slightly flattened, with two dentiform setigerous tubercles anteriorly and 4 similar tubercles posteriorly, the lateral ones at a lower level. Antero-ventral tooth present. Postpetiole little longer than broad, dorsally strongly convex, lacking distinct rugosities and setigerous tubercles. Gaster smooth and shining.

Pubescence sparse, appressed on scapes, legs, and gaster, oblique and dense on funiculi. Standing hairs very sparse and rather short, stiff and somewhat obtuse at apex; very few on scape, only on dorsal face; practically lacking on legs; 6 longer setae on petiolar node.

Paratype workers. — Essentially alike, with the following range of measurements: Total length 3.3-3.8 mm; maximum of head capsule 0.81-0.90 mm; maximum width of head behind eyes 0.73-0.81 mm; length of scape 0.64-0.71 mm; Weber's length of thorax 0.99-1.13 mm.

Specimens examined. — 7 workers, from Venezuela, captured in the U. S. by Plant Quarantine inspectors, belonging to two series: On *Cattleya* pseudobulb, n. 44.25380, Oct. 23, 1944: 5 workers (holotype and paratypes, USNM, WWK); On *Cattleya*, n. 39-7589, May 5, 1939: 2 workers (paratypes USNM).

On account of the elongate petiole, the postero-dorsally and more or less pointed metasternal lobe and the somewhat longer scape, this species belongs to the group of *asper* being closest to *pleuriticus*.

It differs from the latter species by the completely sculptured head, the scarce and short standing hairs, separated from each other by a distance visibly greater than their length, the opaque thoracic dorsum with very fine longitudinal rugae, the lighter color, larger size, the scarcely rugose and tuberculate postpetiolar node.

15. *Leptothorax* (*Nesomyrmex*) *wilda* M. R. Smith

(Figs. 8, 28)

Leptothorax (*Goniothorax*) *wilda* M. R. Smith, 1943, Proc. Ent. Soc. Wash. 45 : 155-156 (Worker, female; U.S.A., Texas: Brownsville). — M. R. Smith, 1947, Amer. Midl. Nat. 37 : 572, 575, Pl. 11, fig. 42 (Worker; U.S.A.: So. Texas).
Leptothorax (*Nesomyrmex*) *wilda* M. R. Smith, 1951, in: U. S. Dept. Agric. Monogr. 2 : 817 (Mexico).

Types. — Workers and female from Palm Grove, Brownsville, Texas, U.S.A., taken on September 28, 1942, by W. S. Ross, deposited in the U. S. National Museum and elsewhere. I have seen two paratype workers.

Worker (paratypes). — Total length 2.9-3.1 mm; maximum length of head capsule 0.68-0.76 mm; maximum width of head behind eyes 0.60-0.65 mm; Weber's length of thorax 0.87-0.96 mm. Testaceous to yellowish-brown; chewing border of mandibles fuscous.

Head (Fig. 28) slightly elongate; its dorsum and sides opaque, densely punctate and sparsely rugulose. Rugae mostly longitudinal on front and vertex; anastomosing laterally and on occiput; there are also ill-defined shallow foveolae between the rugae. Mandibles subopaque and striate with distinct punctures between the striae. Dorsum of head at each side with a flattened to slightly depressed, indistinctly marginate, scrobe-like area for lodging the scapes. This area nearly lacks macrosculpture. Antennal scape conspicuously curved at base, failing to attain in repose the occipital margin by a distance exceeding its greatest width.

Thorax (Fig. 8) opaque; dorsum rugulose and more finely, sides more coarsely punctate, the latter without rugae. Pronotum almost as long as broad at posterior corners. Mesonotum laterally dentate. Basal face of epinotum with a plate-like, blunt tooth at each side, projecting laterad over the epinotal spiracle which is invisible from above; posterior corners with very short, obliquely diverging, and little raised spines. Metasternal lobes postero-dorsally rounded.

Petiole shortly pedunculate, with a short, elevated node, having a steep anterior face, six setigerous dentiform tubercles on top and a more prominent tooth postero-laterally. Postpetiole transverse, postero-laterally with a small tooth, dorsally opaque and finely longitudinally rugose. First gastric tergite very finely and superficially reticulate, but quite shining.

Pubescence scarce, minute and appressed on scapes, legs and gaster. Standing hairs short, thick, blunt at apex, stiff, whitish, sparsely disseminated, lacking on scapes and legs. Front and vertex of head flanked at each side by a file of these hairs, lacking the same anteriorly on the disc.

Female. — Total length 4.2-4.4 mm; maximum length of head capsule 0.87-0.94 mm; maximum width of head behind eyes 0.72-0.74 mm; Weber's length of thorax 1.27-1.33 mm. Similar to the worker with the differences of the caste. Scape in repose not attaining level of posterior ocellus. A vestigial antennal scrobe present, as in worker. Humeri of pronotum angulate, not dentate. Basal face of epinotum posteriorly with

a pair of short, conical epinotal spines. Basal face of epinotum with a rudimentary tooth antero-laterally above the spiracle, the latter flush with the sides of epinotum.

Distribution. — This species occurs from southern Texas in the United States, to at least the southern limit of the Neotropical region in Central Mexico.

Specimens examined. — 22 workers and 2 females, as follows: U.S.A., Texas: Brownsville, W. S. Ross leg.: 2 workers (USNM, paratypes); Weslaco Co., R. Roberts coll.: 3 workers (WWK). Mexico (all U. S. Plant Quarantine interceptions): locality unknown, taken from orchids at San Francisco, Cal.: 17 workers, 1 female (USNM n. 39-7379, WWK); Vera Cruz, taken from orchids at Laredo, Tex.: 1 female (USNM 45-15394).

The vestigial antennal scrobe and the distinctive shape of the thorax, especially the prominent lateral epinotal tooth, separate the worker of this form from the species of the *echinatinodis*-group, the next relatives. The female resembles that of *clavipilis* (known only from the holotype queen), but seems distinctive by the denticulate petiolar node and the lack of clavate standing hairs.

16. *Leptothorax (Nesomyrmex) rutilans* Kempf

Leptothorax rutilans Kempf, 1958, An. Acad. Brasil. Cien. 30 : 100-101, Figs. 11, 16, 20 (Worker; British Guiana: Kartabo).

This species was described upon two specimens (holotype and paratype, MCZ, WWK) found among, and mounted with, unidentified *Pseudomyrmex* received from the Museum of Comparative Zoology at Harvard University. In the meantime Dr. Brown discovered in the Wheeler miscellany collection a long series of specimens, 35 workers and 1 female, belonging to the same colony as the types, coming from British Guiana, Kartabo, Aug. 19, 1920, W. M. Wheeler leg. n. 543 (MCZ, WWK). These specimens, though not types in the formal sense, are for all practical purposes as good as types, being nidotypes and metatypes.

Worker. — The measurements vary as follows: Total length 2.3-2.7 mm; maximum length of head capsule 0.62-0.67 mm; maximum width of head behind eyes 0.53-0.60 mm; Weber's length of thorax 0.67-0.78 mm. In the original description, by mistake, I stated that the metasternal lobes are pointed or dentate dorsally. This feature, due to the excessive

amount of adhesive was visible on only one specimen. Even there, a droplet of glue formed an artificial tooth on top of the lobe. Examining now the large series of additional workers from the same nest, I realize that the lobes are rounded as in the *echinatinodis*-complex, and the error of the original description and figure (Fig. 20) is hereby corrected.

The shorter scapes, which do not attain the occipital border, the shape of the metasternal lobes and the petiolar node place this species in the vicinity of the *echinatinodis*-complex, differing however quite conspicuously in the smooth and shiny integument of the body and the appendages, the fine silky, abundant standing hair, present also on scapes and legs, the ecarinate anterior border of the pronotum and the weak humeral angle.

Female (undescribed). — Dealate. Total length 3.4 mm; maximum length of head capsule 0.74 mm; maximum width of head capsule behind the eyes 0.60 mm; Weber's length of thorax 1.06 mm. Brown; mandibles, scapes, pronotum, anterior half of scutum, tibiae and tarsi lighter and more yellowish. Head slightly more elongate than in the worker, the sides and occipital border gently convex. Mandibles mostly smooth and shining, with vestigial striae near the apex. Median lobe of clypeus smooth and shining. Anterior half of cephalic dorsum, laterally to the clypeus and front, with widely spaced rugosities, mostly longitudinal, but concentrically disposed around the antennal socket. The rugae disappear at the level of the posterior orbit of eyes. Front and occipital half of cephalic dorsum smooth and shining, but the piliferous punctures are larger, much more deeply impressed than in the worker. Dorsum of pronotum striated, the striae forming concentric arches; shoulders angulate, not conspicuously dentate. Posterior half of scutum and the scutellum longitudinally striated. Basal face of epinotum with vestigial transverse rugosities, the posterior corners rectangular, but not visibly dentate. Declivous face and sides of thorax mostly smooth and shiny. Metasternal lobes rounded. Spinules of petiole and postpetiole weakly developed. Pilosity abundant as in worker.

This caste differs from *echinatinodis* and allies in sculpture and pilosity, the weakly dentate humeral angle, the gently convex sides of the head; from *asper* and *pleuriticus* in the shape of the metasternal lobes and the shorter, broader, and higher petiolar node.

17. *Leptothorax (Nesomyrmex) argentinus* Santschi

(Fig. 6)

Leptothorax (Gontothorax) argentinus Santschi, 1922, An. Soc. Cient. Argent. 94 : 251-252 (Worker; Argentina, Santiago del Estero: Icaño).

Types. — 14 workers, taken by E. R. Wagner at Icaño on the Salado river, Santiago del Estero province, Argentine Republic, deposited in the Muséum de Paris and in the Santschi collection (NHMB). A damaged syntype worker (petiole missing), received on exchange from the Museum of Basle, Switzerland, offers an opportunity for further discussion of this species, known only from type material.

Worker (syntype). — Total length approximately 3.0 mm; maximum length of head capsule 0.76 mm; maximum width of head behind eyes 0.67 mm; length of scape 0.57 mm; Weber's length of thorax 0.87 mm. Testaceous to yellowish-brown.

This is indeed a very close relative of *spininodis* and Santschi's description contains most of the distinguishing features, which consist in the following:

Scape and also extensor face of tibiae with a few standing hairs. Head rather coarsely longitudinally costate-rugose. Scape in repose nearly attaining the occipital margin. Thorax (Fig. 6) short with less sinuous lateral borders as seen from above; mesonotum laterally broadly rounded, scarcely prominent; basal face of epinotum broader, spines much shorter, straight. Metasternal lobe dorsally rounded. First gastric tergite less distinctly sculptured, only finely reticulate and quite shining.

18. *Leptothorax (Nesomyrmex) echinatinodis* Forel

- Leptothorax echinatinodis* Forel, 1886, C. R. Soc. Ent. Belg. 30 : 48-49 (Worker; Brazil: Rio de Janeiro). — Emery, 1896, Bull. Soc. Ent. Ital. 28 : 59 (Key). — Forel, 1899, Biol. Centr. — Amer. Hym. 3 : 55 (Worker). — ?Kusnezov, 1953, Acta Zool. Lill. 13 : 338 (Argentina: Tucuman). — Wheeler & Wheeler, 1955, Ann. Ent. Soc. Amer. 48 : 25 (larva).
- Leptothorax (Gontothorax) aculeatinodis* Emery, 1896, Bull. Soc. Ent. Ital. 28 : 60-61 (Worker; Costa Rica: Jiménez; Brazil: Mato Grosso). — N o v. S y n.
- Leptothorax echinatinodis aculeatinodis*, Forel, 1899, Biol. Centr. — Amer. Hym. 3 : 55 (Worker; Costa Rica).
- Leptothorax echinatinodis* var. *aculeatinodis* Forel, 1912, Mém. Soc. Ent. Belg. 20 : 17-18. — Maun, 1922, Proc. U. S. Nat. Mus. 61 : 31 (Honduras: Ignacio).
- Leptothorax pungentinodis* Emery, 1896, Boll. Mus. Torino, n. 229, p. 2 (Female; Panama: Colón). — Emery, 1896, Bull. Soc. Ent. Ital. 28 : 59 (Key). — N o v. S y n.
- Leptothorax echinatinodis* (?) var. *pungentinodis*, Forel, 1899, Biol. Centr.-Amer. Hym. 3 : 55 (Mexico, Vera Cruz: Atoyac).
- Leptothorax echinatinodis dalmasi* Forel, 1899, Biol. Centr.-Amer. Hym. 3 : 55-56 (Worker, female; Colombia, Sierra Nevada de S. Marta: San Antonio. — Forel, 1912, Mém. Soc. Ent. Belg. 20 : 18 (Colombia, Sierra Nevada de S. Marta, Dibulla). — Wheeler, 1942, Bull. Mus. Comp. Zool. Harvard 90 : 266, Pl. 51, fig. b (Worker; Costa Rica: Alajuela, S. José). — N o v. S y n.

Leptothorax echinatinodis schmidti Menozzi, 1927. Ent. Mitt. 16 : 275-276 (Worker, female, male; Costa Rica: San José). — N o v. S y n.
Leptothorax echinatinodis cordicola Wheeler, 1942. Bull. Mus. Comp. Zool. Harvard 90 : 205-206 (Worker; Panama C. Z.: Red Tank; Panama: Las Sabanas, Tumba Muerta Rd.). — N o v. S y n.

Leptothorax echinatinodis, in the broad sense, comprises several forms that combine the following characters in the worker (and female) caste:

Scapes short, not attaining in repose the occipital margin. Funicular segments III-VI distinctly transverse. Dorsum of thorax noticeably flattened, the anterior border carinate, the lateral borders generally well marginate and quite sinuous. Mesonotum laterally dentate. Epinotal spines long and curved. Metasternal lobes dorsally rounded. Pedicelar nodes laterally with prominent teeth or spinules. First gastric tergite finely sculptured, at least on basal half. Scapes and legs lacking standing hairs.

This definition eliminates *pleuriticus* Wheeler, which has been given species rank on a foregoing page, but applies to *echinatinodis* with its remaining hitherto recognized infraspecific forms, and also includes *umbratilis* Wheeler, described as a full species.

The classification of this variable complex is far from satisfactory and it is apparent that the splitting has been carried to an untenable extreme. At this stage of our knowledge I can do no better than rejecting most of the infraspecific forms as synonyms and recognize only two separate species: *echinatinodis* Forel and *spininodis* Mayr. This solution is obviously provisional and will perhaps not survive an accurate check based on copious material from many localities, presently not available.

Furthermore *echinatinodis* in the new sense comprehends most of the variants and is thus only a residue of classification. In other words, all *echinatinodis*-like specimens that are (1) at least partly dark-colored and (2) have the front and vertex of head partly or completely smooth and shining and (3) the first gastric tergite very lightly sculptured are assigned to *echinatinodis* s. str.

Distribution. — This species occupies the most extensive range, from tropical Mexico to southern (Paraná State) and western (Mato Grosso State) Brazil. The Argentine records are questionable, inasmuch as their witness (Kusnezov, 1953) considers *spininodis* as a synonym of the present species. I have no knowledge of *echinatinodis* specimens from the Argentine.

Material examined. — Brazil, Paraná State: Rolândia (W. W. Kempf) S. Paulo State: S. Sebastião (W. W. Kempf) (WWK); Rio de Janeiro State: Mendes (Eidmann), Porto das Caixas (O. Conde) (CTB), Cabo Frio (C. Gilbert) (WWK); Pernambuco State: Recife (Lima Castro), Caruaru (B. Pickel) (CTB); state and locality unknown (U. S. Plant Quarantine interception at Hoboken, N. J. on imported orchid *Epidendrum* sp. USNM n. 53-8796). — British Guiana: Courantyne river (N. A. Weber) (Weber collection and WWK). — Venezuela (U. S. Plant Quar. Int. on *Cattleya* sp.): Caracas (USNM n. 47-6351), loc. unknown (USNM n. 37-1873). — Colombia: Bogotá (U. S. Plant Quar. Int. on orchid) (USNM n. 36-9301). — Panama and Canal Zone: loc. unknown (U. S. Plant Quar. Int. on orchid *Oncidium confusum*). (USNM n. 47-5649); Tumba Muerte Rd. (W. M. Wheeler) (MCZ, WWK). — Costa Rica: loc. unknown (Nevermann), San José (H. Schmidt) (CTB). — Guatemala: (U. S. Plant Quar. Int. on *Epidendrum fragrans* orchid) (USNM n. 46-5353). — Mexico, Vera Cruz: Pueblo Nuevo (E. O. Wilson) (MCZ, WWK); Rio Frio (U. S. Plant Quar. Int.) (USNM).

Synonymic note. — The infraspecific forms *aculeatinodis* Emery, *pungentinodis* Emery, *dalmasi* Forel, *schmidti* Menozzi and *cordinicola* Wheeler are placed into synonymy of the typical *echinatodis*. They have been founded upon slight differences in color, sculpture and spinulation, and do not constitute so-called geographic races. The only doubtful point in this synonymy concerns *schmidti* on account of its large size (the worker measuring 4.5 mm in total length, according to the original diagnosis) but I suspect that this is just a mistake of transcription or a typographical error. I have not seen any type specimens of the typical form and its presumptive synonyms.

19. *Leptothorax* (*Nesomyrmex*) *spininodis* Mayr

(Figs. 9, 17)

- Leptothorax spininodis* Mayr, 1887, Verh. Zool. — bot. Ges. Wien 37 : 617-618 (Worker, male; ?Brazil: Rio de Janeiro, or ?Chile: Valparaiso). — Emery, 1894, Bull. Soc. Ent. Ital. 26 : 139 (Bolivia: Chulumani Yungas, Coroico). — Emery, 1896, Bull. Soc. Ent. Ital. 28 : 59 (Key). — Emery, 1896, Zool. Jahrb. Syst. 9 : 626 (Paraguay: San Salvador). — Kusnezov, 1951, Fol. Univ. Cochabamba 5 : 68 (Worker, palpi).
- Leptothorax echinatodis spininodis*, Forel, 1899, Biol. Centr. — Amer. Hym. 3 : 55 (Worker). — Forel, 1912, Mém. Soc. Ent. Belg. 20 : 18 (Brazil: Ceará).
- Leptothorax* (*Goniothorax*) *umbratilis* Wheeler, 1921, Zoologica 3 : 160-162 (Worker, female; British Guiana: Penal Settlement nr. Bartica). — Nov. Syn.
- Leptothorax* (*Goniothorax*) *spininodis* var. *genualia* Santschi, 1922, An. Soc. Cient. Argent. 94 : 252 (Worker; Paraguay: Asunción). — Santschi, 1933, An. Soc. Cient. Argent. 116 : 117 (Argentina, Misiones: Loreto). — Nov. Syn.

Types. — One worker and one male, collected by Georg R. von Frauentfelder during the "Novara" voyage from an egg capsule of a mantis, presumably in South America, either at Rio de Janeiro, Brazil, or at Valparaiso, Chile (NHMW). Both specimens have been seen during this study.

All *echinatinodis*-like workers and females, that are (1) rather uniformly testaceous or yellowish-brown and (2) have the dorsum of the head, including front and vertex opaque, finely reticulate-punctate and longitudinally rugulose, without shining areas and (3) the first gastric tergite usually more sharply aciculate-striate on the anterior half constitute *spininodis*, reestablished as a full species. This definition comprises the following variants:

a) Lectotype worker. — Total length 2.8 mm; maximum length of head capsule 0.73 mm; maximum width of head behind eyes 0.69 mm; length of scape 0.53 mm; Weber's length of thorax 0.80 mm. Yellowish brown. Differs from all other specimens comprised under this species in the much rougher sculpture; head, dorsum and sides of thorax being rather coarsely rugose. Petiolar node with only 6 setigerous tubercles; post-petiole, as seen in profile, exceptionally deep and dorsally strongly vaulted. First gastric tergite sharply aciculate-striate in its entire length. Legs finely reticulate, subopaque. Figs. 9 and 17 give a dorsal and lateral view of the thorax and pedicel of this specimen, which is unique in the above characters.

b) The common phase, occurring from the Argentine to Colombia and Venezuela. The worker is more gently sculptured: dorsum of head only finely rugose and sides of thorax only reticulate-punctate. This includes also the "variety" *genualia* Santschi, characterized by fuscous knee joints, i. e. the femur-tibia articulation. Specimens from Misiones identified as belonging to this variety by Santschi, do not differ significantly from the common form.

c) Wheeler's *umbratilis* (1921) described upon several workers and a female taken from a single colony nesting in a *Tachigalia* petiole at the Penal Settlement near Bartica, British Guiana (MCZ). I have examined three syntype workers. Their measurements are as follows: Total length 2.6-2.7 mm; maximum length of head capsule 0.65-0.67 mm; maximum width of head behind eyes 0.57-0.59 mm; Weber's length of thorax 0.71-0.74 mm. They differ from the common (b) variant of *spininodis* in having the median lobe of the clypeus transversely shallowly

concave, with the longitudinal rugosities confined to the sides only; in the finer and more superficial sculpture of the head and thorax, the longitudinal rugosities being less conspicuous and fewer in number, the microsculpture of the base of first gastric tergite only vestigial; in having the petiolar node more elongate and less inflated, and the epinotal spines shorter and less diverging caudad, the apices scarcely curved inward. Most of these characters do not allow for a clear-cut separation from the other variants, and none of them seems to be significant. Hence *umbratilis* must be considered a synonym of *spininodis*. Besides the types only a single specimen from Anápolis, Goiás shows the peculiar features of this phase.

Material examined. — Argentina, Misiones: Loreto (A. Ogloblin) (CTB). — Brazil, S. Paulo State: Agudos (C. Gilbert, R. Mueller & W. W. Kempf) (WWK); Rio Grande do Norte State: Natal (M. Alvarenga) (CTB); Goiás State: Anápolis (W. W. Kempf) (WWK); Pará State: Belém (D. Weil) (WWK). British Guiana: Kartabo (W. M. Wheeler); Penal Settlement ("*umbratilis*" types) (W. M. Wheeler) (MCZ, WWK). — Venezuela: Orinoco Delta (N. A. Weber) (WWK). — Trinidad: Nariva Swamp (N. A. Weber) (WWK). — Colombia: Medellín (N. A. Weber) (WWK).

20. *Leptothorax (Nesomyrmex) clavipilis* (Wheeler)

Nesomyrmex clavipilis Wheeler, 1910. Bull. Amer. Mus. Nat. Hist. 28 : 259-261. Fig. 1 (Female; Island of Grenada, B. W. I.).
Leptothorax clavipilis, Emery, 1922. Gen. Ins. Subfam. Myrmicinae, fasc. 174, p. 250.

Type. — An isolated female (holotype) taken by H. H. Smith at Balthazar on the windward side of the Island of Grenada, B. W. I., deposited in the U. S. National Museum, n. 13.197. Not seen.

According to Wheeler's description and figure, this female does not belong to the *echinatinodis*-group. The specimen seems also sufficiently distinct from the remaining species with 11-segmented antennae by the clavate standing hairs (strangely absent on the disc of the first gastric tergite), by the reduction of rugae and costae and the finely punctured mandibles, by the apparent lack of prominent setigerous spinules on petiole and postpetiole.

Closest relatives are, perhaps, *wilda* and *timidus*. The queen of the latter however, is not known.

Dr. M. R. Smith, upon my request, has compared the female of *wilda* with that of the present species. He writes me, that the differences are of minor degree. "*Wilda* appears to have slightly more pronounced antennal scrobe, a sharper and more truncate anterior border to the thorax, longitudinal rugulae on the mesonotum (absent in *clavipilis*), posterior surface of the petiole broader and each side with 3 rather distinct spines, postpetiole also broader and each side with 2 distinct spines. The spines on each side of the petiole and postpetiole of *clavipilis* are obsolescent or missing; 3 on one side of the petiole and 2 on the other side; 2 on one side of the postpetiole and 1 on the other side. Color and pilosity are very much the same except that the hairs seem to have been rubbed from some parts of the body of *clavipilis*, especially the gaster".

Original description (Wheeler, 1910). — "*Nesomyrmex clavipilis*, sp. nov. Female. Length 2.8 mm. Head with feebly and broadly excised, marginate posterior border; posterior corners and cheeks rounded. Mandibles 4-toothed. Antennal scape reaching to about half the distance between the eye and the posterior corner of the head. Funiculus much longer than the scape; its first joint as long as the 3 succeeding joints together; joints 2-7 broader than long; joints 8 and 9 subequal, together decidedly shorter than the terminal joint. Thorax somewhat narrower than the head, narrower behind than in front, with steep sides. Epinotum in profile with short, stout, blunt teeth and subequal base and declivity, the former feebly convex, the latter flattened. Petiole longer than broad, broadest in the middle; in profile with a moderately high node in the middle, its upper surface depressed, its anterior and posterior declivities subequal and slightly concave. Postpetiole from above transversely elliptical, twice as broad as long and one-third again as broad as the petiole; in profile convex above in front, flattened behind, below with a prominent transverse welt. Gaster considerably larger than the head, its anterior border slightly angular on the sides.

Body, including the mandibles very finely and densely punctate, opaque; legs and upper surface of gaster somewhat shining and more sparsely punctate. Clypeus and front feebly, longitudinally rugose; remainder of head above indistinctly reticulate-rugulose.

Hairs and pubescence yellowish, the former sparse and clavate on the clypeus, upper surface of the head, thorax, pedicel and tip and lower surface of the gaster, longest on the venter and posterior borders of the gastric segments. Pubescence of scapes, cheeks and legs short, on the upper surface of the first gastric segment longer and coarser.

Color yellowish-brown; mandibular teeth, eyes and a spot at the inner border of each ocellus, black. Head with a brown impressed spot about the size and shape of the eye on each side between the eye and the lateral ocellus. Wings yellowish gray, with dilute yellow veins and pale brown apterostigma".

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