

## DORONOMYRMEX POCAHONTAS N. SP., A PARASITIC ANT FROM ALBERTA, CANADA (HYM. FORMICIDAE)

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### SUMMARY

*Doronomyrmex pocahontas* n. sp. is described. The new ant closely resembles the European species, *Doronomyrmex pacis* Kutter. Queens and alate young females were found in 3 colonies of a host species which is or is closely related to *Leptothorax muscorum* (Nyl.). The type locality is Maligne Canyon, near Jasper, Alberta, Canada. The new species is an apparently workerless, permanent social parasite like its congener, *D. pacis*. No males could be identified or distinguished from host species males with certainty. Whether *D. pocahontas* kills the host colony queens or lives alongside them (like *D. pacis*) could not be decided.

### ZUSAMMENFASSUNG

*Doronomyrmex pocahontas* n.sp., eine parasitische Ameise aus Alberta, Kanada

*Doronomyrmex pocahontas* n.sp. wird beschrieben. Die neue Ameise sieht der europäischen *Doronomyrmex pacis* Kutter sehr ähnlich. Königinnen und geflügelte Jungweibchen wurden in 3 Völkern einer *Leptothorax muscorum* (Nyl.) nahestehenden Wirtsart gefunden. Locus typicus ist der Maligne Canyon bei Jasper, Alberta, Kanada. Die neue Art ist offenbar wie *D. pacis* ein arbeiterinloser, permanenter Sozialparasit. Männchen konnten nicht mit Sicherheit identifiziert und von den Männchen der Wirtsart unterschieden werden. Auch ist unbekannt, ob *D. pocahontas* die Wirtsköniginnen tötet oder wie *D. pacis* mit ihnen zusammenlebt.

### DESCRIPTION

***Doronomyrmex pocahontas*, ♀**

Habitus in general like with the queens of the genus *Leptothorax*, subgenus *Mychothorax* Ruzsky. Total length 4 mm including the mandibles. Head length 0.78 mm, head width 0.64 mm, thorax length 1.08 mm, thorax

width 0.6 mm. Mandibles with 5 or 6 teeth; maxillary palps 5-jointed; labial palps 3-jointed. Antennae 11-jointed with a 3-jointed club.

Thorax (fig. 1) as in *Leptothorax acervorum*, or in the host species. Epinotal spines of moderate size, as in *D. pacis* or *L. muscorum*. Epinotal spine index (Buschinger, 1966) ca. 1.7 to 1.8. Wings as in *L. acervorum* or *L. muscorum* (fig. 2), but in living specimens with a steel-blue shimmer, as in *D. pacis*.

Petiole (fig. 3, 4) not pedunculated; viewed from above, its sides nearly parallel, very slightly convex; the summit forming a narrow transverse edge. In lateral view the anterior face is slightly concave, the posterior face very slightly convex, both meeting in the summit with a sharp angle. The lateral edges at their anterior ends form two distinct small teeth at the base of the anterior face just above the articulation of the petiole with the epinotum. A distinct ventral spine marks the anterior end of a sharp ventral edge.

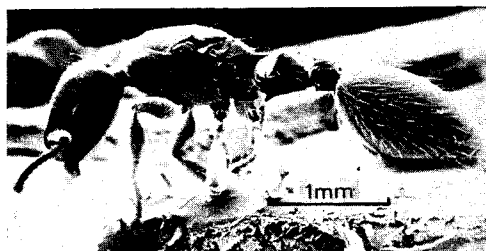


Fig. 1

Fig. 1. — *Doronomyrmex pocahontas* ♀, lateral view.

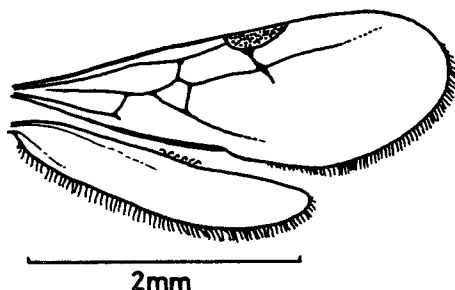


Fig. 2

Fig. 2. — Wings of *Doronomyrmex pocahontas* ♀.

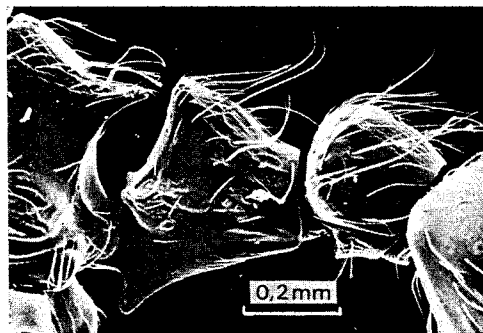


Fig. 3

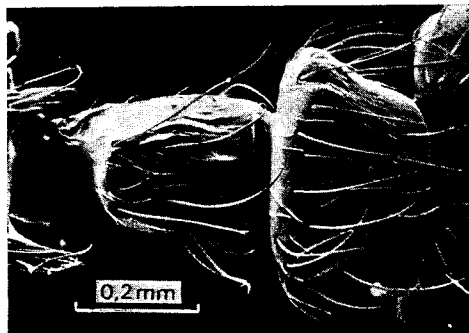


Fig. 4

Fig. 3 and 4. — *Doronomyrmex pocahontas* ♀, petiole and postpetiole in lateral and dorsal view.

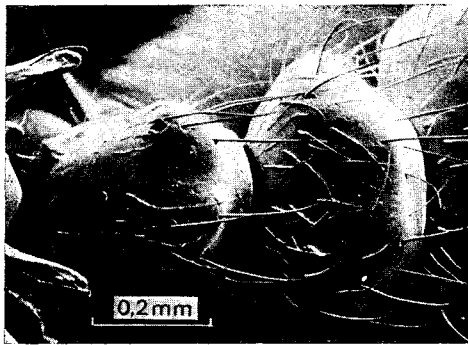


Fig. 5

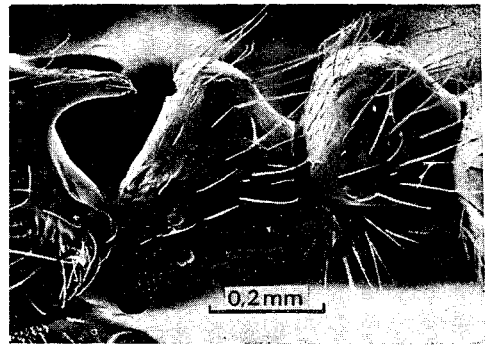


Fig. 6

Fig. 5 and 6. — *Doronomyrmex pacis* ♀, petiole and postpetiole, for comparison.

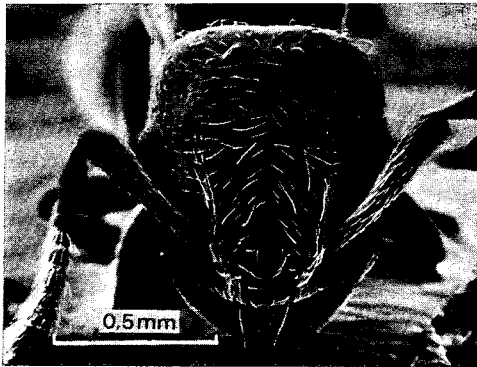


Fig. 7. — *Doronomyrmex pocahontas* ♀, head.

Postpetiole (fig. 3, 4) from above about 1.6 times broader than the petiole, trapezoidal, with anterior margin about 1.8 times broader than the posterior margin. Compared to *D. pacis* (fig. 5) the anterior margin is rather straight. In lateral view the gently convex anterior face reaches the summit in the first third of the total length, the summit forming a rounded, nearly right angle. The posterior face descends, slightly convex, towards the gaster. Ventral spine rather small in comparison to *D. pacis*, (fig. 6) but distinct.

Head, thorax, petiole, postpetiole, and gaster mostly smooth and, as in *D. pacis*, very strongly shining. The cuticular sculpture is restricted to a few shallow longitudinal rugae and sparse punctures of the head (fig. 7), especially around the compound eyes and on the sides of the thorax.

Body generally covered with extraordinarily long, golden, tapering hairs which are recurved near their tips. On the frontal portion of the head, the hairs appear to be combed inward toward the midline from both sides and forward from the posterior border towards the ocelli (fig. 7).

Legs and antennal scapes with shorter appressed hairs, funiculus with

dense suberect hairs. Length of gastral and petiolar hairs 0.18 to 0.22 mm (in *D. pacis*: 0.12 to 0.14 mm, in the host species of *D. pocahontas*: 0.1 to 0.12 mm).

Coloration: Whole body dark blackish-brown. Neck yellow, distal half of the mandibles (except the black teeth), antennae, and legs (except the darker middle parts of the femurs) reddish-brown.

Three alate females were dissected. They had 6, 7 and 8 ovarioles respectively, and were not yet inseminated. The number of Malpighian tubules was 5. The poison gland appeared essentially normal in size and shape, as in *Leptothorax acervorum* and other *Mychothorax* species. The Dufour's gland is somewhat bigger than in normal independent *Mychothorax*, but not nearly as conspicuous as in *Doronomyrmex pacis* (BUSCHINGER, 1974). /ot

*Worker caste*: apparently absent. Among the 484 host workers of the 3 colonies one intermorph of *D. pocahontas* was found: An individual with very long hairs as in the female, chocolate brown in colour, and with the thorax somewhat larger than in the host workers. The pro-meso and meso-epinotal sutures are faintly visible, but the dorsal sclerites are not nearly so big as in the female. Two small ocelli present on the head. Although I doubt that such "workers" are a normal feature of this species, the existence of this individual shows that a worker caste (if one existed) would be distinguishable from the host workers by the characteristic long pilosity.

*Male*: Despite the presence of many males in the *D. pocahontas* colonies, I am not yet certain that they belong to the parasite species. I could not detect any taxonomically useful differences between males from unparasitized host species colonies and from *pocahontas* colonies. These males also lack the ventral spine on the postpetiole (which is typical of *D. pacis* males). On the other hand we know that, in *D. pacis* colonies, males and females of the host species are produced alongside sexuals of the parasite species. Thus, all the males might belong to the host species.

*Locus typicus*: Near Jasper, Alberta, about 100 m east of Maligne Canyon, ca. 200 m north of Maligne Canyon parking lot, in a rather open pine forest with sparse low vegetation consisting of small shrubs, grass, and lichens. The ants were found under flat stones lying on a layer of decaying pine needles with fungus mycelia.

*Derivatio nominis*: The new species was found and identified while I was staying at Pocahontas Bungalows near the east entrance to Jasper Park, Alberta. Pocahontas is the name of a North American Indian princess (1595-1617) who was born in Virginia (Encyclopedia Britannica). The word means "the playful one" and is descriptive of the problems that I had in identifying the males.

*Differential diagnosis*: As already noted, the new species is surprisingly similar to the European workerless parasite, *Doronomyrmex pacis* described by KUTTER (1945, 1950); and I have no doubt that it belongs to the same

genus. With *D. pacis* it shares the ventral spine on the postpetiole (fig. 3), the extraordinarily long hairs, the smooth and shining cuticle, and, of course, the parasitic mode of life. However one can distinguish it from *D. pacis* by the even longer body hairs, the appressed tibial pilosity, the shorter postpetiolar spine, and the shape of petiole and postpetiole (fig. 3, 4, 5, 6).

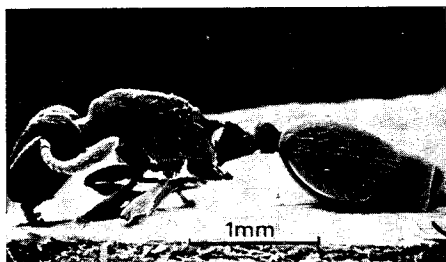


Fig. 8

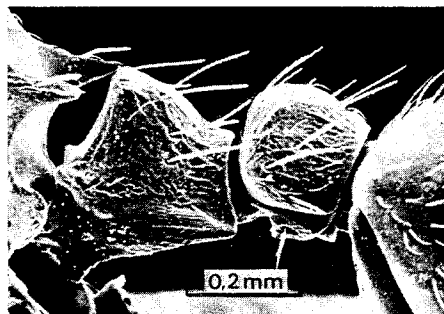


Fig. 9

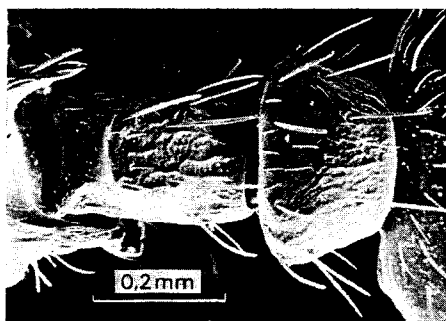


Fig. 10

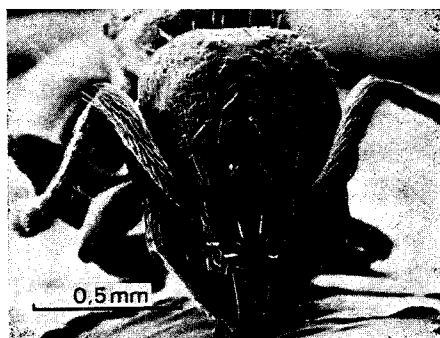


Fig. 11

Fig. 8-11. — *Leptothorax "muscorum"* ♀, host species of *D. pocahontas*.

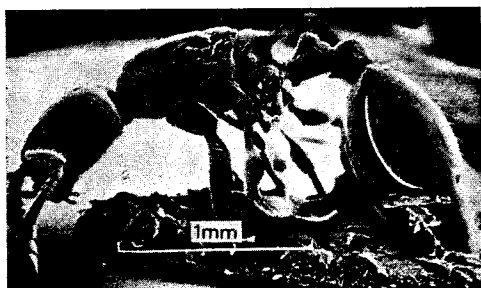


Fig. 12

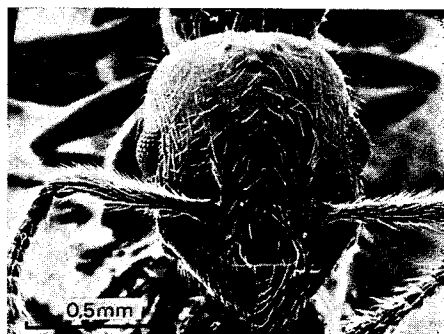


Fig. 13

Fig. 12. — *Doronomyrmex pacis* ♀, lateral view. Fig. 13. — *Doronomyrmex pacis* ♀, head.

From its host species (fig. 8, 9, 10, 11), *D. pocahontas* differs in the characters mentioned above, especially the long hairs, the smooth cuticle, and a much broader postpetiole. Unlike most independent European species of *Mychothorax*, this host ant has a small ventral spine on the postpetiole. The host species is apparently closely related to *L. muscorum*, but it could not be identified with certainty.

Holotype female, 2 host females, 2 males of a *D. pocahontas* colony (host species males ?) and 5 host workers deposited in the M.C.Z. Harvard University, Cambridge, Mass.

### Biological notes

Three colonies containing *D. pocahontas* were found on July 28 and 29, 1977, along with 27 unparasitized host-species colonies at the type locality in an area of about 100 × 200 m. The ants were collected with the aid of an aspirator. Efforts were made to collect the colonies as completely as possible. All 3 parasitized colonies were recognized as being "abnormal" immediately because of the surprisingly dark and shining appearance of the parasite females.

The composition of the *Doronomyrmex* colonies when counted during the evening of the day of their collection was as follows :

#### Col. 1 (July 28) :

- 1 *D. pocahontas* queen (dealate, physogastric, similar to most egg-laying *Mychothorax* queens)
- 79 alate *D. pocahontas* females
- 5 males, apparently of the host species
- 158 host workers
- 53 host workers pupae
- Numerous eggs and larvae, no male or female pupae.

#### Col. 2 (July 29) :

- 1 *D. pocahontas* queen
- 1 workerlike intermorph of *D. pocahontas*
- 2 alate *D. pocahontas* females
- 2 males, apparently of the host species
- 107 host workers
- Numerous eggs, larvae and host worker pupae, no male or female pupae. .

#### Col. 3 (July 29) :

- 1 *D. pocahontas* queen
- 199 host workers
- 39 alate host females
- 62 males, apparently of the host species
- Numerous eggs, larvae, host worker pupae, no male or female pupae.

Out of a total of 27 host species colonies without *D. pocahontas*, 10 contained one host queen ; 12 contained between 2 and 11 dealate females ; and no dealate female was found in 5 colonies. In one colony with 11 dealate females, only 1 was inseminated and fertile, the other 10 being unfertilized and sterile. However, two colonies contained 2 inseminated, egg laying

queens each and thus were polygynous. The other females could not be dissected. Hence, the host species is facultatively polygynous like *L. acervorum*, the host of *Doronomyrmex pacis* (BUSCHINGER, 1968). All host species colonies had worker pupae; 16 had male and female pupae (mostly not yet pigmented); and in only two colonies a few males, and in four colonies a few females, had already eclosed. This is a remarkable difference in comparison to the *pocahontas* colonies, where all the sexuals had already eclosed (even the host females in col. 3). The most surprising characteristic of the *pocahontas* colonies was the lack of host queens. *D. pacis* queens live alongside one or several host queens in the parasitized *L. acervorum* colonies (BUSCHINGER, 1971). However, I cannot completely exclude the possibility that the host queens were present in the *pocahontas* colonies and that I lost them during collection. This possibility is at least suggested by the production of numerous host workers in the colonies n° 1 and 2 (where young *pocahontas* females had already eclosed). Col. n° 3 had apparently been infested by the *Doronomyrmex* queen only one year prior to collection; and I suppose that her eggs had not yet developed into young sexuals. A recent infestation by a newly mated young female can be excluded, since the queen was as physogastric as the other two *pocahontas* queens. On the other hand, we know that, in *D. pacis* and *Harpagoxenus sublaevis*, young females normally arise from larvae after their second hibernation. Except for the one intermorph in colony n° 2, I did not find any worker which could be regarded as belonging to the parasitic queens. *D. pocahontas* thus seems to be workerless, like its European congener.

Further field studies will be necessary to determine whether *D. pocahontas* lives alongside or kills the host colony queens. In this context it may be of some importance that the *D. pocahontas* females are considerably larger than the host queens, whereas *D. pacis* females are smaller than their host species queens.

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