A NEW ANT, POLYERGUS NIGERRIMUS MARIK., SP. N., (HYMENOPTERA, FORMICIDAE) AND SOME FEATURES OF ITS BIOLOGY

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The Amazon ant was described from Europe more than a century and a half ago by the famous entomologist Latreille (1798), under the name Formica rufescens. Later (1804) he established a new genus for the species he had discovered, calling it Polyergus Latr. The rust-colored Amazon ant Polyergus rufescens Latr. immediately attracted the attention of many naturalists on account of its peculiar biology.[1] The species occurs in Europe from Italy to the Balkans (Ruzskiy, 1905). In North America 6 subspecies have been described, one of which, P. rufescens Lucidus (M.), is sometimes treated as an independent species (Creighton, 1950). I have found the ant in fairly large numbers in mountain spruce forests in the Tien-Shan range (Marikovskiy, 1958) and later near Tomsk (middle course of the River Yai). Its distribution is apparently wider than has been thought; probably it will be found in other parts of Siberia and the Far East and is a Transpalearctic species.

I found the new species in the Tuva ASSR, on the left bank of the upper reaches of the River Yenisei, near Kyzyl, in semidesert overgrown mainly with Artemisia frigida Willd., Kochia prostrata Schrad. and Agropyron cristatum (L) P. B. The ant population of this locality was made up chiefly of the very numerous shiny ant (Formica gagates Latr.), the rarer slender-headed ant (Formica exsecta pressilabris Nyl.) and the black-headed ant (Formica uralensis Ruz.), which occurred in negligible numbers. The new species is clearly distinguished from the rust-red Amazon ant by a number of peculiarities, and seems to be a form peculiar to the desert and semidesert landscapes of Asia. Following is a description.

Workers[2] (Figs. 1, 4). Head mat, finely rugulose, oblong, slightly narrowed toward the evenly rounded occiput; 1/4 or 1/5 longer than its width. The maximum diameter of the eyes conspicuously greater than the distance between the posterior ocelli, including their diameters. Frontal ridges short. Frontal area not very shiny, sometimes conspicuously rugulose. A narrow, very shiny band stretching from the frontal area in the direction of the anterior ocellus. Anterior margin of clypeus almost straight with a row of long, light setae. Numerous setae also on rest of clypeal surface. A small group of sturdy setae on occiput. Mandibles shiny, covered with sparse, short setae, curved, slightly widened, and with a row of small denticles in middle part of inner surface. Maxillary palps 4-segmented, slender, weak, short, 1/3 the length of the mandibles. Labial palps 2-segmented, very short, hard to distinguish. Antennae 12-segmented, without erect hairs. Scape of antenna covered above with appressed setae, slightly curved, appreciably thickened apically, not reaching the occipital margin of the head. 1st and 2nd flagellar segments the longest, of equal length, slightly longer than the terminal segment. The remaining flagellar segments all short and of about the same length, covered with short appressed setae.

Pronotum above elongate-spheroidal with sparse, long, erect setae. Posterior surface of metanotum almost vertically truncate and with rather sparse long setae. Thorax mat, delicately rugulose. Legs shiny, covered with short, appressed hairs. Node thick, large, bulging in front, flattened behind with a sloping depression in upper half and large, long setae on the margins that are directed slightly laterad and caudad. A group of setae also on underside of node. Abdomen with long rust-red setae, their length usually 1-1/2 times that of the 1st flagellar segment; abdomen not very shiny above, velvety surface of tergites finely rugulose; abdomen below shiny as though lacquered.

Body black with a barely perceptible brownish tinge. Legs, antennae, mandibles, dark brown. Length 4.5–5.0 mm.

Female (Fig. 2, 5). Head broader and shorter than in the worker. Scope of antenna short, reaching only the level of the anterior ocellus. Length of flagellum almost equal to that of head.

Thorax covered with denser hairs, arranged almost evenly over the whole dorsal surface. Wings hyaline, with a light brownish tinge. Venation as shown in Fig. 7. Node also large, thick, with dense long setae. Appreciably more, although shorter, setae on abdomen than in the worker. Entire body, apart from the dark brownish flagellum of antenna, deep black, very finely rugulose, very shiny. Length 7-7.5 mm.

In addition to the ordinary females, 1 underdeveloped female was found in the nest. Apart from the thorax, the size and shape of the body were exactly the same as in the true female. The thorax differed from that of the worker in that the pronotum was just perceptibly distended. The color and surface of the integument of this form were the same as in the female but the legs were lighter.

Male (Fig. 3, 6). Head broad, short, finely rugulose, mat. A few short setae only in the clypeus. Scope of antenna barely reaching level of anterior ocellus. 1st flagellar segment small, its diameter slightly shorter than its length; 2nd 2--2-1/2 times as long as 1st; remaining flagellar segments shorter than 2nd and more or less equal to one another.

Thorax almost bare, slightly shiny. A small number of setae arranged more or less evenly on dorsal surface of mesothorax and metathorax. Node small, deplanate, with a very pronounced deep apical incision; its lateral lobes sharply rounded, set with setae. Abdomen shiny, covered with numerous short setae that are more abundant on the last segments. Body deep black, only tibiae and tarsi dark brown. Length 5–5.5 mm.

The species described is readily distinguished from the red Amazon (Polyergus rufescens Latr.) by its black color, more mat body surface and small size. In addition, by comparison with the red Amazons at the author's disposal, which are from the vicinity of Tomsk and various parts of the Tien-Shan, it was found that in the new species the frontal area was more mat and the maxillary palps shorter, the clypeal setae more sparse on the anterior margin, the head perceptibly elongate, primarily at the expense of the occiput, the eyes larger. The setae covering the body, particularly on the abdomen, were perceptibly longer: for example, 1-1/2 times as long as the 1st flagellum segment, whereas in the red Amazon they are only slightly longer than it. The sculpturing of the worker's body surface is coarser. A characteristic feature of the new species is the large node.

The types are preserved in the ZIN collection.

[1] The Amazon ants periodically raid the nests of certain species of the genus Formica L., from which they obtain the so-called "helpers"; these do all the work, including feeding the Amazons themselves, who are incapable of finding their own food and feeding themselves.

[2] Some authors classify the sterile females of the red Amazon ant as "soldiers". I shall keep the term "workers".

The colony I observed raiding for pupae was outwardly no different from a small colony of Formica gagates Latr. nests. It consisted of seven mounds spread over an area of about 10 m². Each mound had one main passage leading into the underground part, surrounded by a small rampart of the freshly removed earth and denuded of vegetation. 6 or 7 of the nests were small, with numerous chambers and inhabited by a very small number of ants. The 7th, in the center, had a complicated network of passages with numerous horizontal chambers at various levels. The passages and the chambers went deep into the earth. Unfortunately, the very pebbly soil and the large number of stones made it impossible to discover how far down the chambers went. In this central nest the Amazon ants lived along with the pupae, winged females and males, the single underdeveloped female and the "helpers" – the gagates. I failed to discover any wingless females.

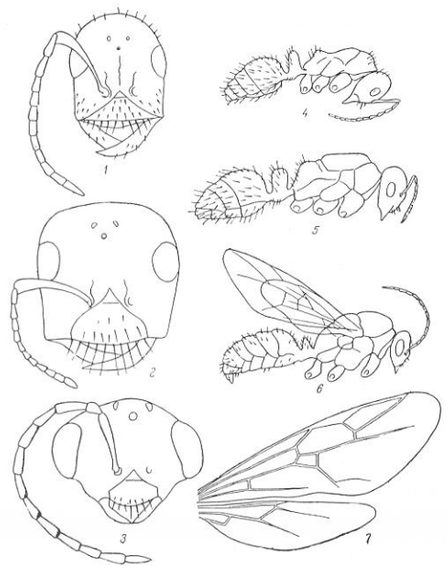
The Amazon ants went after the pupae in the evening, at sunset. I came upon the column when it was already fully drawn up. Without the slightest deviation it moved straight to the nearest small colony of gagates, 20 m away, fast and without stopping once. Having reached the nest the attackers immediately penetrated it. The procession back, with the pupae – in this nest they were bare – started almost at once. During the attack many of the ants of the raided nest started running off in various directions; but not more than a dozen of them carried pupae. The pillaging thus presented a substantially different picture from what I had observed during a raid by Amazon ants in the Tien-Shan Mountains (Marikovskiy, 1958), when the host ants dragged their pupae in all directions away from the nest. This time the host ants attacked the black Amazons as they carried off their captive pupae. Some tried to rescue the latter, catching them by any part of the body that presented itself. None of the Amazons attempted to protect itself with its jaws, even when unencumbered by a pupa; the number of attackers was fairly large but there were no casualties on either side. The amazons, especially those carrying off pupae, repelled the attackers with extraordinary, repeated, lightning blows of the body.

As they came out of the nest with their burdens, the Amazons at first dispersed over a wide front, then, gathering into a tight column, retraced their former route. This made it difficult for the hosts to attack, since the Amazons were scattered over the territory where the skirmishes took place.

The ants did not put all the pupae into the main nest but into the nearest subordinate nest, even though this was 1/2 m away from the main nest. Here the pupae were taken by the "helpers" of their own species. An insignificant number of them were carried off into a 2nd subordinate nest behind the main nest. Some of the Amazons, after reaching one of the subordinate nests, dropped their pupae and quickly crawled back, but on meeting the returning column returned with it. About 400 ants took part in the raid. Nearly every participant captured one pupa. None, however, managed a second journey. The ants were crawling all over the ground on the territory of their own colony for some time after all the pupae had been transferred to their dwelling, but this activity gradually ceased and they disappeared into the nest. The whole raid took about half an hour.

In many ways, then, the raid was a simpler affair than the one I had seen the red Amazons make (Marikovskiy, 1958). In particular, the column did not move so much like an organized procession and the ants had not prepared a temporary staging post near the nest they were attacking, so that each participant could leave its pupa and make several journies.

The behavior of the ants in the ravaged nest was peculiar too. Immediately the raid was over they started to return to their nest. Many ants, obviously belonging to the so-called "internal service"[3], were dragged along in the jaws of the others. There were several rescued pupae outside the dwelling. These were quickly brought in again. When darkness fell the ants started to block the single entrance to the nest with pieces of earth and fragments of plants. This peculiar barricade was gradually broken down, but only by the end of the next day.



Figs. 1–7. Polyergus nigerrimus Marik. sp. n.
1 – Head of worker; 2 – head of female; 3 – head of male; 4 – worker; 5 – female; 6 – male; 7 – female wing.

The black Amazons transferred all the pupae from the temporary shelter to the main nest. It was characteristic that for the next 2 days of observations of this nest, until it was dug up, the Amazons did not show themselves at all at the surface, although their "helpers" were fully active and about their usual tasks. This behavior makes it extremely difficult to find the black Amazon except when it is on the march for purposes of a pupa raid. This should be kept in mind in searches for the species.

[3] A term used in myrmecology to mean ants working inside the nest, and usually, not leaving it.

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