

A SUPPLEMENT TO THE REVISIONS OF
THE DACETINE ANT GENERA *ORECTOGNATHUS*
AND *ARNOLDIDRIS*, WITH KEYS TO THE SPECIES¹

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The *Orectognathiti* are a small group of dacetine ants found in the Australopapuan area, grouped into two genera, *Orectognathus* Fr. Smith and *Arnoldidris* Brown. Previous revisions (Brown, 1950, 1953) have recognized nine species in the first and four in the latter genus; of these, I had been able to study directly only six species of *Orectognathus* from satisfactory material and under favorable conditions. Recently, however, I have been able to see additional material collected by E. O. Wilson in New Caledonia and New Guinea, and in eastern Australia by Father C. Mercovich and myself. Furthermore, through the kind help of Curator Elisabetha Bajári of the Hungarian National Museum, I have been loaned the types of *Orectognathus csikii* Szabó, *Arnoldidris biroi* (Szabó), *A. horvathi* (Szabó) and *A. chyzeri* (Emery). During a hurried visit to the British Museum, I saw the type of *Arnoldidris longispinosus* (Donisthorpe), but was unable to make a proper sketch or notes beyond the affirmation of the species as a true *Arnoldidris* of the *biroi* group.

In the present paper, I propose to add two new *orectognathite* species and to offer notes on the characters, biology and distribution of some older ones. For the sake of a complete treatment and full keys, I have included notes and a figure of the manuscript species as derived from the characterization of (*O. nigriventris*) by Father Mercovich. It may be some time before the formal description of Father Mercovich's species appears in print, and neither he nor I intend that the preliminary informa-

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tion concerning the species offered here should be considered as constituting publication of (*O. nigriventris*).

The aid of Curator Bajári, Father Mercovich and Dr. Wilson in preparing this supplement is gratefully acknowledged. The abbreviations of measurements and indices, and also of places where specimens are deposited, are as in my other works on the dacetines, including the *Orectognathus* revision (Brown, 1953).

Arnoldidris biroi (Szabó)

A single worker taken by Wilson at Wamuki, about 800 m. altitude, Mongi Watershed, Huon Peninsula, New Guinea, agrees well with a type from the Hungarian National Museum. Wilson's worker was taken from a shrub in rain forest, foraging during daylight hours.

Arnoldidris horvathi (Szabó)

The type collection of this ant, possibly the most bizarre formicid known, remains the only sample known. The type confirms the figures of Szabó in all important respects.

***Arnoldidris szentivanyi* sp. nov.**

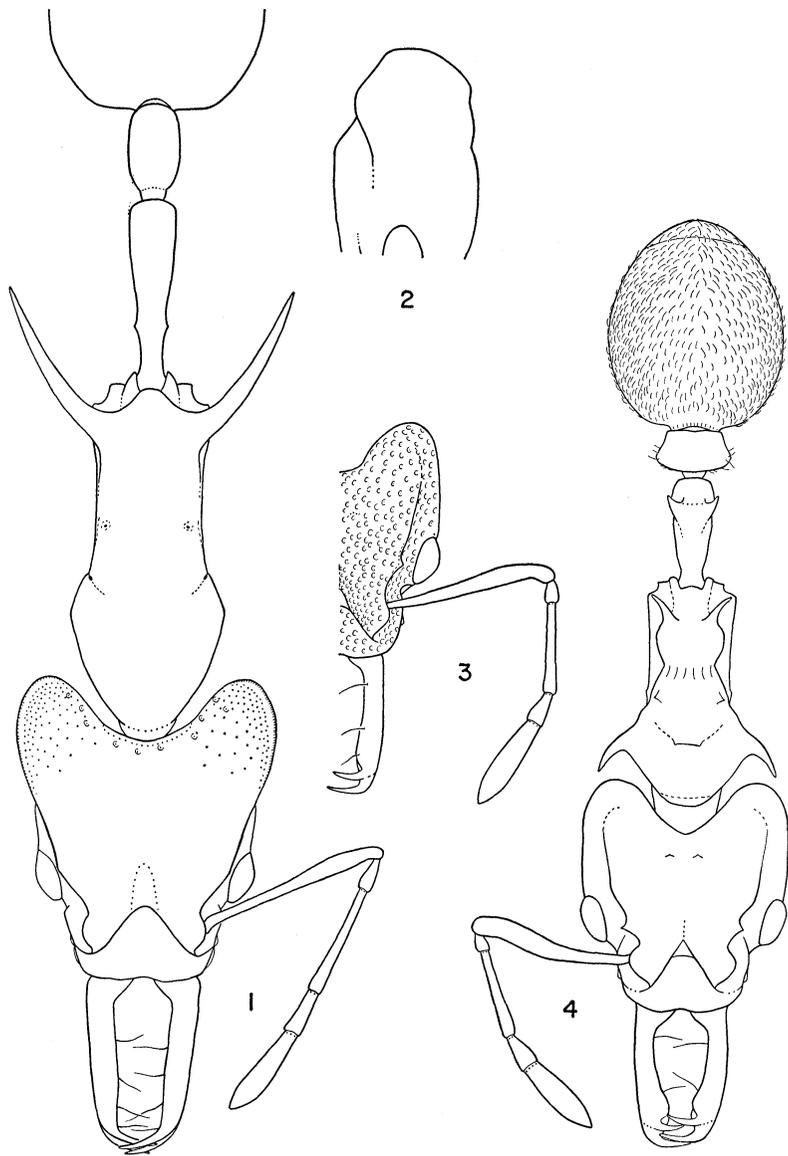
(Figures 1, 2)

Holotype worker: TL 6.1, HL 1.38, HW 1.18 (CI 86), scape L 0.92, max. diameter of eye 0.27, ML 0.80 (MI 58), WI 1.66 (occipital lobes overlap pronotum about 0.17 mm., an amount duly subtracted from TL), petiole L in side view 0.83, postpetiole L 0.35, gaster L 1.25, propodeal spine L 1.12, gaster W 1.02, pronotal W 0.71 mm.

Form as shown for the paratype in Figure 1 and Figure 2. Occipital lobes each bordered dorsolaterally by a rounded carina, indicated in the figures. Mesepisternum on each side extended as a shallow translucent lobe overlapping the upper posterior part of the fore coxa. Metapleural lobes rounded. Petiole very slender, gently arched,

EXPLANATION OF PLATE 1

Figures 1 to 4. Figure 1, *Arnoldidris szentivanyi* sp. nov., paratype worker, dorsal view. Figure 2, same, side view of posterior half of head. Figure 3, (*Orectognathus nigriventris* Mercovich ms.), worker from type series, dorsal view of half of head. Figure 4, *O. phyllobates* sp. nov., holotype worker, dorsal view. All to same scale. Drawings by Nancy Buffer.



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its anterior peduncle very slightly depressed, the nodal portion approximately circular in cross section.

Body generally smooth and strongly shining; underside of head with strong, crowded but separate foveolae; a few small, inconspicuous foveolae on dorsum of head in zone bordering occipital excision, but most of upper surfaces of occipital lobes with no more than small, widely-spaced punctures. Pubescence and pilosity absent from body generally, except for the sensory setae of labrum and mandibles, the short hairs at gastric apex, and a dilute reclinate pubescence of the antennae, legs and mouthparts, most noticeable toward the extremities.

Color rich medium brownish-red; vertex and a median area just behind clypeus almost imperceptibly shaded; mandibles, antennae, legs and gaster clear yellow; mandibular apices, dorsolateral margins of occipital lobes, propodeal spines and both nodes ferruginous yellow.

The holotype [MCZ] was collected with seven worker and two dealate female paratypes at the village Ebabaang, altitude about 1400 m., in the Mongi Watershed, Huon Peninsula, New Guinea, April 18, 1955 (E. O. Wilson leg.). The seven worker paratypes [MCZ, HNM, USNM]: TL 5.9-6.4, HL 1.31-1.43, HW 1.12-1.23 (CI 85-87), ML 0.74-0.82 (MI 57-58), WL 1.59-1.75 mm. Color of head and alitrunk varies from light to rather dark reddish-brown; infuscation of vertex absent to fairly distinct. Propodeal spines vary slightly in length, angles of elevation and divergence, and in strength of their arch as seen from the side; in some specimens the tips are a little more strongly deflected ventrad than in others.

One of the two dealate females: TL 6.5, HL 1.43, HW 1.28 (CI 90), ML 0.80 (MI 56), WL 1.76 mm. Similar to worker, with the female differences usual for dacetines. Compound eyes only slightly larger than in worker; ocelli small but distinct. Meso- and metanota together forming an abruptly raised dome, smooth and shining, with scattered small punctures. Propodeal spines straight (not gently arched as in worker), only the extreme tips slightly deflected ventrad. Sculpture, color and pilosity as in worker, except that punctures on dorsal surfaces of oc-

occipital lobes are more abundant and larger, more nearly foveoliform. The second female paratype has the propodeal spines very slightly arched as seen in side view, but still straighter than in any of the workers.

Wilson found the first workers (No. 839) foraging on bushes or small trees under 2 m. tall, at about noon on a sunny day, but in deep shade in rain forest. Careful search of the ground litter below the bushes turned up two dealate females and additional workers, indicating that the nest was inadvertently scattered. The workers are very slow and deliberate in their movements, and often stand still in one spot for long periods. One worker was seen walking with gaster recurved under the alitrunk. None was seen with prey, which could have been one of the numerous *Collembola* seen so commonly on stems and leaves of trees where the ants were taken. In a colony fragment returned to the United States alive, the female and four workers were exceedingly sluggish, and failed entirely to attack some entomobryid collembolans enclosed in a small nest with them in such a way that numerous contacts between springtails and ants were enforced. One egg was laid by the ants, but this disappeared within a few days. The colony appeared to be disorganized, and the adults spent much of their time resting on the glass cover forming the ceiling to their chamber. After two or three weeks, all adults had died.

A single worker labeled "Wisselmeren: Obano," collected at 1770 m. in Netherlands New Guinea by J. L. Gressitt, is slightly larger than the *szentivanyi* type series: TL 5.8, HL 1.44, HW 1.30 (CI 90), ML 0.83 (MI 58), WL 1.73 mm., but is similar in form. Its color is darker: head and alitrunk blackish-piceous; nodes and alitrunk orange or deep ferruginous yellow; legs and antennae ferruginous yellow, mandibles straw yellow. Punctuation of head more distinct throughout, especially over the entire dorsal surfaces of occipital lobes, which are covered with spaced, umbilicate foveolae. Whether this specimen belongs to *szentivanyi* and is merely a geographical variant can only be decided by the study of more material.

Key to *Arnoldidris* species, based on workers

1. Each occipital lobe drawn out into a long, dorsally curved, tapered spine *horvathi* (Szabó)
Occipital lobes rounded or bluntly angulate, not drawn out into acute teeth or spines 2.
2. Propodeal spines and petiole long, but not extremely so, about 3/4 as long as the greatest width of the gaster; color (of type worker) yellow, with blackish alitrunk and nodes *chyzeri* (Emery)
Propodeal spines and petiole extremely long, about as long as the gaster is wide; color not as above, the head and alitrunk usually darker than the gaster 3.
3. As seen from directly above (full-face view of head), the occipital lobes terminate each in a blunted angle 4.
As seen from directly above (full-face view of head), the occipital lobes each end in an evenly rounded full curve 5.
4. Head and alitrunk brownish-red, gaster yellow *biroi* (Szabó)
Head and alitrunk predominantly black or piceous, gaster brownish-yellow *longispinosus* (Donisthorpe)
5. Color of head and alitrunk rich medium brownish-red, gaster yellow; coarse punctures on occiput restricted to the immediate zone along the posterior excision *szentivanyi* Brown
Color of head and alitrunk predominantly black or piceous, gaster brownish-yellow; coarse punctures or foveolae widely distributed and conspicuous over occipital lobes The specimen from Wisselmeren, discussed under *A. szentivanyi*.

Orectognathus antennatus Fr. Smith

Specimens have been received from an additional Australian locality, the collection by Father C. Mercovich: Calga, New South Wales. These specimens average a little smaller than samples previously found: minimum HL 1.31 mm.; CI 75-76, MI 64-65.

Orectognathus sarasini Emery

In my *Orectognathus* revision of 1953, I followed Emery in recognizing *O. sarasini* as a distinct species, although it seemed from the original description that there was not much difference from *antennatus*. Wilson has now taken good series referable to *sarasini* in different localities in the southern half of New Caledonia. The material is divided between two distinct color forms, which, however, have the same measurements and the same general structure: TL 4.2-5.3, HL 1.07-1.26, HW 0.81-1.00 (CI 76-79), ML 0.64-0.71 (MI 59-60), WL 1.12-1.31 mm. (workers). A female from series No. 115 measures: TL 5.6, HL 1.24, HW 1.04 (CI 84), ML 0.69 (MI 56), WL 1.40. A male measures: TL 3.7, HL 0.69, HW 0.74, WL 1.26 mm. (Series No. 115).

This species is like *O. antennatus*, from which it differs only by the minor features cited in the key; the greater development of the humeral and anterior mesonotal protuberances is a relative character, difficult to appreciate without comparison direct of material of both forms. As Wheeler suggested, it is entirely possible that *antennatus* and *sarasini* are conspecific, but in the absence of objective criteria for their true relationship, it seems best to continue to distinguish them as arbitrary species, especially in view of the possible complications next discussed.

Emery described *O. sarasini* from Mt. Canala, New Caledonia. Wilson has seen type material, and affirms that it corresponds to a color form that he took, not at Canala, but at Mt. Mou and Le Chapeau Gendarme, which is concolorous clear ferruginous yellow, with only the legs lighter yellow (Mt. Mou: Nos. 115, 141; Le Chapeau Gendarme, No. 91 and Berlese samples). At and around Ciu, on the approaches to Mt. Canala, Wilson collected several series at about 300 m. altitude (Nos. 251, 289, observation colonies CC and EE, berlesates) in which the color of the workers is strikingly different: the color differs from that of *sarasini* in that the alitrunk and dorsum and sides of the head (except occipital lobes and sides of clypeus) are piceous, appearing black to the

naked eye. The remaining parts are ferruginous yellow, although the gula and both nodes are slightly tinged with brownish. The female is colored much like the worker.

The male of *sarasini* is like the *antennatus* male, but is smaller and with proportionately narrower gaster; the surface of the gaster, while variable, tends to be much more smooth and shining; pubescence of gaster much reduced, less even than in *antennatus*.

The question arises as to whether the black-and-yellow form truly belongs to *sarasini*, or is a different species; this question can be answered only by a more intensive study of the distributions of the two types of color pattern. It is interesting to speculate that the original Canala concolorous population may have changed, in a period of four or five decades, to a bicolorous condition. Rapid changes of this type are not unknown in other animal groups (e. g., snails of the genus *Partula*, Crampton, 1917, 1932) that occur in insular situations.

Of the Mt. Mou collections of the concolorous yellow form, No. 115 was a small colony in a cavity about 3 cm. across under a small rock in wet soil by a stream, altitude between 180 and 400 m. The colony had a single queen and brood. No. 141 consisted of workers taken foraging on the trunks of two trees growing close together in dry forest; the collection was made during the first two hours of darkness and at a height of from 1-2 m. above the ground. The same spot was visited during daylight hours, but no further specimens were found. At Le Chapeau Gendarme, No. 91 was a nest in a rather dry dead branch, about 7 cm. in diameter, lying on the ground amid dry, thin leaf litter. This colony was observed for a short time in the artificial nest, but during that time it did not feed on any of the collembolans or other small arthropods that were provided. At this locality, stray workers were also taken in leaf litter berlesates.

At Ciu, No. 251 was a colony of about 30 workers, a single dealate female, 3 males, and 20-30 larvae and pupae gathered in a small circular cavity about 4 cm. wide in thin soil collected between two large rocks on the floor of rain forest. No. 289 was a colony taken under a rock

in a drier, more open part of the forest. Other samples from Ciu came from soil cover berlesates.

***Orectognathus phyllobates* sp. nov.**

(Figure 4)

Holotype worker: TL 4.5, HL 1.12, HW (disregarding compound eyes) 0.97 (CI 87), scape L 0.78, greatest diameter of eye 0.24, ML 0.64 (MI 57), WL 1.14 (occipital lobes overlap pronotum by about 0.12 mm., an amount subtracted from WL to obtain TL), petiole L in side view 0.47, postpetiole L 0.22, gaster L 1.00, propodeal spine L 0.28 mm.

Form as shown in Figure 4. Occipital lobes concave inside the bluntly carinate continuations of the frontal carinae; vertex convex, bituberculate centrally. Maximum depth of head about $\frac{2}{3}$ HL. Antecular teeth well developed, acute and sharply elevated. Mandibles strongly concave inside, even more so than in (*O. nigriventris*), the heavy preapical convexities correspondingly stronger. The three apical teeth subequal in length; upper tooth diverging from the lower pair as seen in end-on view of mandible.

Alitrunk in the typical *Orectognathus* plan; pronotum depressed and marginate, with a pair of strong, acute, anteriorly curved teeth, incrassate basally; rear of pronotum sloping through a gradual curve up to the mesonotum. Mesonotum raised in the usual manner; anterior tubercles low, blunt; posterior pair higher, more dentiform, though with extreme tips blunt. Propodeal spines strongly elevated, approximately straight in side view, diverging and slightly outcurved in dorsal view. Petiolar teeth strong, acute, curving posterodorsad, but with apices deflected. Postpetiole subtrapezoidal in dorsal view (Figure 4); in side view semiglobose in outline.

Body generally smooth and shining, with widely scattered inconspicuous punctulae in some areas. Sides of posterior alitrunk with some rather irregular rugosity; metanotal groove with short longitudinal costulae; costulae at base of gaster very short, almost obsolete, confined

to the basal ring or groove. Funiculi and tarsi finely and densely punctulate, subopaque. Most dorsal surfaces of body, including humeral teeth, pronotum and sides of head, with a fairly abundant but short, fine and inconspicuous pilosity, mostly arched-subappressed, but becoming curved-erect on mesonotum. In Figure 4, only the pilosity of postpetiole and gaster is depicted; the gastric pilosity, in the form of a conspicuous whitish decumbent pubescence, is very even, evenly spaced, and quite distinctive. On legs and antennae, a dilute oblique pilosity becomes shorter and denser as a pubescence apicad.

Head, alitrunk and both nodes piceous brown (with a hint of reddish that may be due to fading), gaster deep piceous, nearly black. The general body color appears approximately black in life. Mandibles and antennae yellowish-brown, basal 2/3 of mandibles and middle of scape tending more toward light yellowish. Legs brown, with conspicuous broad bands of light straw color occupying the basal third of each of the six femora and the middle third of each of the two anterior tibiae.

The holotype [MCZ] and only known species of *O. phyllobates* was taken at the edge of the ravine which constitutes Joalah National Park, near the top of Tamborine Mt., southeastern Queensland. The ant was taken in late afternoon from the foliage of a glossy-leaved woody plant, a shrub or young tree, about three feet above the ground. The plant was growing in a very small opening in rain forest, the result of the falling of a medium-sized tree from the canopy. Intensive search was made of the ground cover near the plant, but no indication of the nest could be found.

O. phyllobates is most closely related to (*O. nigriventris*), but is easily distinguished by means of its broader postpetiole, by its smooth, shining, afoveolate sculpture, by its darker color, by its slightly stronger gastric pubescence, its more concave inner mandibular borders, and other minor details. *O. sexspinosus* Forel is lighter in color and is generally more slender, with much longer teeth or spines on the alitrunk, and it has no teeth on the petiolar node.

The discovery of *phyllobates* on foliage well above the ground, and Wilson's observations on *O. sarasini* climbing tree trunks at night, tend to show that *Orectognathus* may be more or less generally a nocturnal, arboreal or subarboreal forager. That *O. clarki* Brown may have similar habits seems likely, in view of the fact that this species is never seen foraging outside the nest during the daytime (so far as limited observations go).

Key to *Orectognathus* species, based on workers

1. Each occipital lobe drawn out as a stout, acute, dorsally curving tooth (n. Queensland) *satan* Brown
Occipital lobes bluntly rounded posteriorly, without teeth 2.
2. Propodeal spines about 3 times as long as the distance between the centers of their bases; body and limbs with abundant, generally-distributed, fine, short, erect pilosity; petiolar node very slender, unarmed. (Queensland) *sexspinosus* Forel
Propodeal spines markedly less than 3 times as long as the distance between the centers of their bases; either the body without generally-distributed pilosity, or else the petiolar node bidentate, or both 3.
3. Inner mandibular border just basad of apical teeth with a small tooth or dentiform angle, acute to subacute at tip 4.
Inner mandibular border without an acute or subacute tooth or toothlike angle in the region just basad of the apical teeth, though some species have a rounded flange or thickening in this region 5.
4. Paired anteocular teeth, and a pair each on the vertex and petiolar summit, developed and acute; erect pilosity present and generally distributed over body (New Guinea) *csikii* Szabó
Anteocular teeth and teeth of vertex obsolete, petiolar teeth nearly so; erect hairs confined to mandibles, under-mouthparts and gastric apex (Lord Howe I.) *howensis* Wheeler
5. Anteocular teeth lacking or represented only by an obtuse angle on each frontal carina; head narrower, CI normally 75-80 in the worker 6.

- Anteocular teeth developed and normally strong, acute or at least rectangular; head averaging broader, CI 79-97, only rarely less than 81 8.
6. Lamellate margin of inner mandibular border narrow throughout, not or scarcely expanded near the apical teeth (Queensland) *mjobergi* Forel
Lamellate margin of inner mandibular border with a distinct, rounded, subapical expansion or flange . . 7.
7. Size smaller, head length (HL) less than 1.30 mm.; pronotal teeth larger and blunter; anterior mesonotal tubercles well developed (New Caledonia)
. *sarasini* Emery
Size larger, head length (HL) 1.30 or more; pronotal teeth smaller and more acute; anterior mesonotal tubercles poorly developed (s. e. Australia; North I., N. Z.) *antennatus* Fr. Smith
8. Dorsal surface of head smooth and shining, with minute punctures or small, spaced foveolae; dorsal surface of gaster with a fine but distinct, more or less reclinate, pubescence-like pilosity 9.
Dorsal surface of head covered with coarse, crowded and often contiguous foveolae, the integument consequently subopaque to opaque; dorsal surface of gaster with only an extremely fine and dilute, appressed, pubescence-like pilosity (workers more or less polymorphic) 10.
9. Dorsal surface of head smooth and shining, with only the most minute and inconspicuous of punctulae; postpetiole at least 1½ times as broad as long, much broader anteriorly than behind (Figure 4) (s. Queensland) *phyllobates* Brown
Dorsal surface of head smooth and shining, but sown with numerous circular, umbilicate foveolae (Figure 3); postpetiole only slightly broader than long, with convex sides, not or scarcely broader in front than behind (e. New South Wales)
. (*nigriventris* Mercovich ms.)
10. Inner mandibular borders approximately straight along basal 2/3; polymorphism of workers extending

to a very large-headed, broad-jawed soldier form in addition to more "normal" workers (e. New South Wales, s.e. Queensland) *versicolor* Donisthorpe
 Inner mandibular borders shallowly but distinctly concave along basal 2/3; worker polymorphism not extending to the extreme large-headed, broad-jawed soldier form (Tasmania, s. Victoria to mts. of s.e. Queensland)
 *clarki* Brown

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