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X.—*A Catalogue of the Species of Ants found in Southern India.* By T. C. JERDON, Esq., Assistant Surgeon, Madras Medical Establishment.

[Concluded from p. 56.]

2nd Tribe. PONERITES.

GENUS ODONTOMACHUS, Lat.

The single species of Ant which I place under this head appears to correspond pretty well with the characters of the genus which have already been given.

24. *Odontomachus rufus*, Jerdon (p. 116).

Worker, length $\frac{1}{4}$ th of an inch; head bulging at the sides, narrowed in front; eyes of moderate size, anterior; antennæ rather long, slender; jaws closely approached at their base, long, linear, with three strong pointed teeth at the end; thorax narrow; abdominal pedicle raised, pointed and conic; abdomen long, oval; head, thorax and legs rufous; abdomen dark brown.

I obtained this ant under stones in a jungle in the Salem district, and know nothing of its habits.

I have since obtained one individual also in the Wynaad, which may be the warrior of this species, if the society consist of different individuals. It is $\frac{1}{2}\frac{1}{4}$ ths of an inch long, and appears only to differ, besides its larger size, in having the eyes smaller and more advanced, the teeth of the jaw blunt, and the thorax finely striated.

HARPEGNATHOS*, Jerdon, new genus (p. 116).

Gen. Char. Jaws scythe-shaped, pointed, and finely serrated; head oblong, notched behind; eyes very large, situated at the anterior extremity of the head; antennæ rising between the eyes; abdominal pedicle slightly raised.

I cannot class this remarkable ant as an *Odontomachus*, and have therefore been compelled to institute a new genus for its reception; some of the characters given may not be generic, but, till other species are discovered, it is difficult to say which are, and which are not, of generic value.

25. *Harpegnathos saltator*, Jerdon (p. 117).

Worker, head long, granulated; jaws with a strong tooth near the base pointing downwards and inwards, and thence gradually

* This name is too like *Harpognathus* of Wesmael, who used it for a genus of *Staphylinidæ* in 1834.—F. M.

tapering to the tip, and finely serrated, $\frac{1}{6}$ th of an inch long; thorax barely grooved; abdominal pedicle small, low, ovate; abdomen very long; sting large; head and abdomen blackish brown, thorax and legs rufous. Length $\frac{3}{4}$ of an inch.

I have not seen this remarkable ant in the Carnatic. I first saw it at Tellicherry, and subsequently in other parts of Malabar. It is also found in the Mysore country, as I learn from Mr. Hamilton, a most talented and industrious amateur entomologist.

I have given it the name of *saltator* from its power of making most surprising jumps, which it does when alarmed or disturbed. It is very pugnacious, and bites and stings severely. It makes its nest underground, generally about the roots of some plant. Its society does not consist of many individuals. It appears to feed on insects, which it often seizes alive.

Genus PONERA, Lat.

Its generic character has been given above.

26. *Ponera sculpta*, Jerdon (p. 117).

Worker, length from $\frac{5}{17}$ ths of an inch to nearly $\frac{1}{2}$ an inch; head oblong, pointed in front and rounded behind; jaws large, triangular, armed with, alternately, a large and a small tooth; eyes very large, nearly medial; antennæ inserted on a line just in front of the eyes, rather long; thorax nearly uniform in width and height; abdominal pedicle raised, pointing forwards with two small spines; abdomen long, cylindrical; legs long; the whole body curiously sculptured, being channeled and grooved in different directions, longitudinally, circularly, obliquely, giving a peculiar dull appearance; colour blackish green.

This is one of the commonest species of Ant in Malabar, extending from the level of the sea up to the top of the Neilgherries. It lives in the ground in small societies, often making its nest in a flower-pot, occasionally under a large stone. It does not work in concert, being generally seen solitary. It lives on animal substances, but apparently will also take vegetable matter. I have seen two fighting for a ripe seed of the Lantana.

I have not met with the female of this species.

27. *Ponera stenocheilos*, Jerdon (p. 118).

Worker, length $\frac{3}{8}$ ths of an inch; head large, square behind, pointed and advancing anteriorly, widest in front of the eyes which are large; antennæ long; jaws very long, linear, ending

in a strong tooth externally, and a smaller one at the internal angle; thorax narrow; abdominal pedicle raised, rounded, pointing backwards; abdomen very long; sting large; legs long; colour dingy greenish-brown.

I have found this ant very rarely in Malabar, and know nothing of its habits.

28. *Ponera processionalis*, Jerdon (p. 118).

Worker, length $\frac{1}{3}$ rd of an inch; head oblong, advanced anteriorly; eyes medial, large; antennæ moderately long, thickened at the end; jaws triangular, strongly four-toothed; thorax wide, not grooved; abdominal pedicle of equal width with the thorax, square truncated; colour shining black.

I have met this species over most of India. It lives in the ground in very numerous societies, and is most frequent in jungly districts; occasionally a vast column of them, three or four deep, may be seen crossing a road, and I have traced the column for forty and fifty yards. It stings very severely.

29. *Ponera affinis*, Jerdon (p. 118).

Worker, length $\frac{1}{3}$ rd of an inch; head oblong, notched behind, advanced anteriorly; jaws triangular, strongly toothed; antennæ thickened at the tip; eyes somewhat anterior, moderately large; thorax slightly grooved; abdominal pedicle pointed, thin; abdomen oval, colour dingy black.

I have only procured this ant once in Malabar, and know nothing of its habits.

30. *Ponera rufipes*, Jerdon (p. 119).

Worker, length $\frac{2}{16}$ ths of an inch; head oblong; eyes anterior, small; antennæ short and thick; jaws triangular, finely toothed; thorax not furrowed, truncated posteriorly; abdominal pedicle wide, thick, truncated, and excavated posteriorly; abdomen long, the division of the joints strongly marked; body ridged, furrowed, and channeled throughout; antennæ, legs, and end of abdomen dark rufous, rest of the body dull black.

I have procured this ant only on one occasion, hitherto, in Malabar.

31. *Ponera pumila*, Jerdon (p. 119).

Worker, length about $\frac{1}{3}$ th of an inch; head oblong; eyes rather small, advanced; jaws triangular, strongly toothed; antennæ thickened; thorax smooth; abdominal pedicle long, square; abdomen long, cylindric; dull black, with rufous legs and antennæ.

I found this ant in Malabar, where it is rare.

3rd Tribe. FORMICITES.

We now come to the last family, containing those ants that have no sting, and the abdominal pedicle of one knot only. It comprises two genera, *Polyergus* and *Formica*, but I do not think we possess any species of the former genus.

Genus FORMICA.

This genus comprises two distinct forms, the one with spines on the thorax, the other unarmed, which certainly ought to form two genera, inasmuch as this distinction is made to separate *Atta* from *Oecodoma*†.

* *Without spines on the thorax.*

32. *Formica compressa*, Fabr. ? Jerdon (p. 119).

SYN. *F. indefessa* ‡, Sykes, Trans. Ent. Soc. i. p. 104.

Worker, length $\frac{4}{10}$ ths to $\frac{1}{2}$ an inch; head oblong, notched behind; eyes medial, of moderate size; jaws triangular, toothed; antennæ long; thorax widened anteriorly; abdominal pedicles somewhat diamond-shaped above, much raised and thin as seen laterally; legs rufous, the rest of the body black.

Warrior, $\frac{6}{10}$ ths of an inch long; differs from the ordinary worker in the head being proportionally much larger, and the jaws having blunt teeth.

Male, length $\frac{4}{10}$ ths of an inch; has a small triangular head, lateral eyes, three ocelli, the thorax raised in front, and the abdominal pedicle broader; wings do not reach to end of abdomen.

Female, $\frac{3}{8}$ ths of an inch long; very similar to the male, has the jaws strongly toothed, somewhat oblong, and the abdomen proportionally large.

This species, well known in India as the Black Ant, is found throughout every part of this country which I have traversed, except the western coast, where I have never seen it. It appears to me that it lives in very numerous societies in the ground, the entrance to the nest being often round the trunk of a tree, or close to some building. The warriors are very numerous. Their food is chiefly vegetable secretions, sugar, &c., and Colonel Sykes has given an interesting account of the devastations committed by them on preserves, sugar, &c. They bite rather severely, but the pain is quite momentary. At certain times great numbers of the winged males and females are seen at the mouth of the nest, and they remain there for several days.

† In the former part of this paper, p. 49 *et seq.* this name is *misprinted* *Ocodoma*.

‡ Col. Sykes's specimens of *F. indefessa* are in the Museum at the East India House.—F. M.

When they take wing, they do so in vast numbers, and always at night.

33. *Formica angusticollis*, Jerdon (p. 120).

Worker, $\frac{1}{2}$ an inch long; head long, oblong, ending posteriorly in a narrow neck; eyes posterior, of moderate size; jaws triangular, strongly toothed; antennæ long; thorax low, narrow, uniform; abdominal pedicle conical, high, narrow; abdomen oval; colour dull black, with antennæ and legs rufous.

Warrior, $\frac{9}{12}$ ths of an inch long; head very large, notched posteriorly; eyes much smaller; otherwise similar. I have only found this ant in forests in Malabar, and always singly.

34. *Formica smaragdina*, Fabr. (p. 121).

Worker, length about $\frac{4}{10}$ ths of an inch; head long, triangular; antennæ long; eyes large, medial; jaws triangular, pointed, with sharp teeth; thorax not furrowed; abdominal pedicle long, low, narrow, linear; legs long; colour of a uniform pale rufous.

Male, $\frac{7}{4}$ ths of an inch long; head diamond-shaped; eyes lateral, small; thorax raised in front; abdomen small; wings reaching beyond the abdomen; of a rufous colour.

Female, $\frac{7}{8}$ ths of an inch long; head short, triangular; eyes lateral; three ocelli; thorax very large, wide; abdominal pedicle wide in the middle as viewed from above, very thin laterally; abdomen large; wings reaching beyond abdomen; entirely of a pale shining green colour.

This ant is well known in Malabar and the wooded parts of India, but is rare in the Carnatic, where I have only seen it in one or two large mango-groves. It forms a nest of living leaves which it draws together without detaching from the branch, and unites with a fine white web; sometimes this nest is above a foot in diameter, but usually smaller. The society consists of a vast number of individuals, and in large nests we find many females and males, both with and without their wings at all times of the year. They are very bold and pugnacious, and bite very severely. They live chiefly on vegetable secretions, and are very partial to the flowers and buds of some of the *Loranthi* which abound so on the western coast; they often form a temporary web round the flowers, or sometimes round the fruit of various trees, viz. the *Eugenia malaccensis*, *Artabothrys odoratissima*, &c., apparently only for the purpose of feeding undisturbed; they will, however, also sometimes feed on decaying animal matter. It is said that the web they form is occasionally used in writing on in the N.W. provinces of India, and that the ants are made use of to destroy a nest of wasps that may have established themselves in a house. In this case they are said to

destroy all the wasps, but become so infuriated, that their own indiscriminate attacks are nearly as bad as those of their foes. In gardens they are most partial to mango-trees, and also to the large leaves of the Jaméi Malae (*Eugenia Malaccensis*), but in the jungles they select a vast number of trees, or rather make no selection at all.

35. *Formica longipes*, Jerdon (p. 122).

Worker, length $\frac{1}{3}$ th of an inch; in form exceedingly similar to the last; head more oblong than triangular; eyes more posterior; antennæ very long; abdominal pedicle shorter proportionally; abdomen a longer oval; legs very long, of a pale rufous colour throughout, tinged with dusky on the abdomen.

This ant is found in all the forests of India, living in holes in the ground, in tolerably numerous societies, and feeding on vegetable secretions. I have not seen it at any distance from the jungles. At Tellicherry, for example, I have never seen it, but as soon as you go a little inland and get into the jungle you meet with it. It is often found about bungalows and out-houses.

36. *Formica timida*, Jerdon (p. 122).

Worker, length $\frac{2}{4}$ ths of an inch long; head oblong, oval; eyes large, posterior; jaws triangular, strongly toothed; thorax smooth; abdominal pedicle raised, conical; colour dingy rufous, darkest on the head, and tinged with dusky on the abdomen. All the body covered with long scattered hairs.

Warrior, $\frac{1}{2}$ an inch long; differs from the ordinary worker in the head being much larger proportionally, and notched posteriorly; thorax thicker, and the abdomen shorter.

Female, like worker, but somewhat larger, with wings, and three ocelli. Male, $\frac{7}{4}$ ths of an inch long; thorax much elevated; eyes large; head small; three ocelli; wings reach beyond the abdomen.

I have only found this ant on the Malabar coast, where it is very common, living chiefly on vegetable secretions. It has its nest under ground. It is very different in habit from the other large red ant (*F. smaragdina*), being most timid, and if approached or touched, dropping to the ground at once and hiding itself. It does not always confine itself to vegetable matter. On one occasion I had a box of pigeons containing some squabs placed in a room on the floor. I next morning found several of the squabs dead, covered with these ants, chiefly however the warriors.

37. *Formica stricta*, Jerdon (p. 123).

Worker, length $\frac{7}{10}$ ths of an inch; head nearly square, slightly

narrowed anteriorly; jaws rough, triangular, strongly toothed; eyes large, posterior; prothorax wide, metathorax narrowed; post-thorax in the form of a rounded narrow platform, ending in two points, and truncated; abdominal pedicle blunt, rounded, raised; abdomen short, oval; antennæ rufous; head and thorax dull greenish black, shagreened; abdomen shining glaucous green; legs shining black.

I have found this ant on flowers in Malabar, but have never seen its nest; it is not a very common species.

38. *Formica cinerascens*, Fabr. (p. 123).

Worker, length $\frac{3}{8}$ ths of an inch; head large; eyes rather small, posterior; jaws strongly toothed; thorax wide in front, narrowed behind with two glands on each side above; abdominal pedicle elevated, conic; abdomen oval; colour dull black, except the abdomen, which is glaucous green, and somewhat pubescent. Female $\frac{1}{2}$ an inch long nearly; head smaller; thorax not so wide; abdomen long, oval; wings not reaching to the end of the abdomen.

Male, $\frac{5}{8}$ ths of an inch long; similar in form to the female, but with much narrower abdomen, and head still smaller proportionally. Warrior, $\frac{5}{12}$ ths of an inch long; head large; antennæ short; eyes minute.

This species lives in the ground in small societies. I have only seen it in the Carnatic. It is described as having the head fulvous, and a triangular spot on the abdomen; but as it is said by Fabricius to have been sent from Tranquebar, in the vicinity of which I have seen our present species, I think they are probably identical, and that the difference of colour is accidental, especially as there are only two species common in the Carnatic with glaucous abdomen, this and our *F. rufoglauca*.

39. *Formica velox*, Jerdon (p. 124).

Worker, length $\frac{5}{16}$ ths of an inch to $\frac{6}{24}$ ths; head long, oblong; eyes posterior, large; jaws strongly toothed; antennæ long; thorax smooth; abdominal pedicle raised, somewhat rounded, wide above; abdomen with the divisions of the segments strongly marked; legs long; colour dull blackish, with the abdomen greenish pubescent.

This ant is very common in Malabar, and I think is also found in the Carnatic. It frequents flowers, especially delighting in those that have great quantities of pollen, such as the *Cucurbitaceæ*, *Hibisci*, &c. It runs very speedily, and is very easily alarmed, dropping to the ground on being touched. I have not succeeded in finding its nest.

40. *Formica rufoglauca*, Jerdon (p. 124).

Worker, $\frac{7}{8}$ ths of an inch long; head long, oblong; eyes large, posterior; jaws strongly toothed; thorax not grooved; abdominal pedicle raised, conic, wide above; abdomen fine silky glaucous green; head, thorax and legs bright rufous.

Warrior, $\frac{9}{8}$ ths of an inch long; head large; eyes much smaller; antennæ shorter; abdominal pedicle flattened posteriorly; abdomen short and triangular; colour similar.

I have found this ant only in the Carnatic, in small societies, living in holes in the ground.

It is possible that this may turn out to be Fabricius's species *cinerascens*.

41. *Formica vagans*, Jerdon (p. 124).

Worker, $\frac{5}{4}$ ths of an inch long; eyes large, medial; antennæ long; abdominal pedicle raised, rounded; legs very long.

Female, $\frac{5}{2}$ ths of an inch long; the thorax shorter and wider, and abdomen very large; wings reaching beyond the abdomen.

This little ant is exceedingly common in the Carnatic, but I have not seen it on the Malabar coast. It takes up its quarters in any sheltered spot in a house, under a box, a stone, a hole in the wall, or such like places, and when disturbed flits with great speed to another suitable spot. Its society is very numerous in individuals, and there are many females and males, sometimes with, at other times without wings. It feeds both on vegetable and animal substances, preferring the former like all the true *Formice*.

42. *Formica assimilis*, Jerdon (p. 125).

Worker, exceedingly similar to the last.

Length $\frac{5}{4}$ ths of an inch; differs in its colour, chiefly being of a shining reddish black, in its eyes being apparently large, the thorax narrower, and in being covered all over with scattered white hairs.

I have found it frequenting flowers in Malabar, but not abundant.

43. *Formica phyllophila*, Jerdon (p. 125).

Worker, length $\frac{7}{8}$ ths of an inch; eyes small; anterior jaws triangular; thorax slightly furrowed posteriorly; abdominal pedicle thin, low, linear; abdomen large, triangular; legs and antennæ rather short; colour shining brown-black.

This little species forms a temporary nest usually between two leaves, or sometimes in a head of flowers. It lives in small societies, and feeds entirely on vegetable secretions.

44. *Formica nana*, Jerdon (p. 125).

Worker, length not $\frac{1}{12}$ th of an inch; eyes anterior; thorax wide; abdomen long, elliptical; head and thorax brown; antennæ, legs and abdomen pale whitish brown.

This minute species is found in all parts of India, and is abundant in Mysore; but from its small size is noticed with difficulty. It feeds on flowers and vegetable secretions.

** *With spines on the thorax.*

45. *Formica nidificans*, Jerdon (p. 125).

Worker, $\frac{5}{24}$ ths of an inch long; head triangularly ovate, elevated; eyes moderate; jaws strongly three-toothed; thorax wide anteriorly, narrowed behind, with two small spines anteriorly pointing forwards, and two large ones behind pointing upwards and backwards, and two rudimentary spines or points behind and beneath these latter; abdominal pedicle square, raised, with two large upright spines, and a smaller one on each side; abdomen short; head and abdomen rufous; thorax dark glossy brown.

Female, $\frac{1}{3}$ rd of an inch long, similar to the worker; three ocelli on top of the head: wingless.

This ant makes a small nest about half an inch, or rather more, in diameter, of some papyraceous material, which it fixes on a leaf. I have opened two, each of which contained one female and eight or ten workers. It is very rare, and I have only seen it in Malabar.

46. *Formica sylvicola*, Jerdon (p. 126).

Worker, $\frac{5}{12}$ ths of an inch long; head narrowed in front and rounded behind; eyes posterior, salient; antennæ inserted in front of the eyes, with a strong crest bordering their insertion internally; jaws short, with five teeth, the upper one much the longest and bent; thorax wide, with two spines on its anterior angles, and two stronger ones posteriorly pointing backwards and upwards; abdominal pedicle large, square, ending behind in two large curved spines, pointing backwards and outwards, and two points or tubercles behind and between them; abdomen short, oval, colour dull black; abdomen shining glaucous green.

Female, $\frac{9}{24}$ ths of an inch long, differs in the anterior thoracic spines being apparently shorter, and in having three ocelli: wingless.

This ant has the same habits as the last, but is not found except in the jungles. It appears very closely allied to *F. hastata* of Latreille, from India, and to several other species said to be from Southern Asia; and as many of these may be found in

India, I add here a brief description of them taken from St. Fargeau's work on Hymenoptera :—

“*Formica sexspinosa*, Latr. Body black, covered with a fine silky yellowish down, especially on the abdomen; head oblong, narrowed posteriorly; antennæ long; posterior angles of the head salient; jaws large, triangular, with three or four teeth; eyes small, globular, salient; thorax with two spines anteriorly on its lateral angles, and two on the posterior extremity pointing backwards; abdominal pedicle thick, rounded in front, truncated posteriorly, with two spines *almost as large* as those on the posterior extremity of thorax. Length $7\frac{2}{3}$ lines (French). From Southern Asia.

“*Formica hastata*, Latr. Black, finely shagreened and slightly hairy; head short; antennæ long; jaws short, with two teeth and a larger curved one at the end; space between the antennæ elevated, with an arched crest on each side; eyes small, round; thorax cubical, compressed, its surface flat, and the ridge on each side sharp, anteriorly wide and square, with a spine on each side, at the humeral angles strong, sharp, straight, and reaching to the head; its posterior part truncated, with a strong spine at each angle pointing obliquely upwards; abdominal pedicle large, triangular, with its upper edge concave, a small tooth in the middle, and a strong arched spine on its lateral angles directed backwards, with a little tooth beneath each. Length 4 lines. From India.

“*Formica relucens*, Latr. Exceeding like the last (*F. hastata*), but differs in the following points—body covered with silky, golden, shining down, with a few larger hairs; thorax with two spines anteriorly and none posteriorly; abdominal pedicle with four spines, the upper ones nearly straight. Length 4 lines. From Southern Asia.

“*Formica Ammon*, Latr. Very like the two last; body black, striated, with a few hairs; thorax ashy; anterior angles advanced; posteriorly the lateral angles prolonged into a large straight spine, pointing backwards; abdominal pedicle large, triangular, with the upper angles prolonged into a very long curved spine, directed backwards; abdomen covered with a silky golden down. Length $2\frac{1}{2}$ lines. From Southern Asia.

“*Formica carinata*, Fabr. Head rounded, black; thorax black, divided into three by two deep transverse lines; the anterior portion with a spine on each side directed forwards, and the posterior part with two small straight spines; abdominal pedicle large, square, with two raised sharp bent spines. Length? of medium size. Southern Asia.”

I have very little doubt but that many more species of ants will be discovered even in the southern portion of the Peninsula, and I hope myself to add others to the present list, and more especially to gain additional information on their habits.

XI.—*Note on the Greenland and Iceland Falcons.*

By JOHN HANCOCK, Esq.

SINCE the publication of my paper in 1838 on the Greenland and Iceland Falcons, I have had the opportunity of examining a great number of specimens of both species, and have found much to corroborate the opinion I then expressed of the distinctness of the two kinds. I must now have seen upwards of 150 specimens, and have had in my possession at one time no less than seventy individuals. This extended experience enables me to correct an error in the description of *Falco Grœnlandicus*. I find that I have confounded the young with the adult of this species, and am wrong regarding the immature.

When I drew up my paper I considered all the white birds from Greenland to be mature, describing the nest plumage from a dark specimen, which having a white quill-feather coming, seemed to prove that it was the young of this species. There is now no doubt that this is wrong, and that this individual is really an immature Iceland falcon,—the white quill-feather being abnormal.

The Greenland falcon is never dark like the young of the other species; in fact, the nest plumage of the former is always whiter than the mature plumage of the latter, and is not frequently as white as that of the mature of its own species.

The mature Greenland falcon is distinguished from the young, not so much by its greater whiteness as by the character of the markings, which on the back and scapulars are always cordate inclining to sagittiform; the head, under parts and tail are frequently unspotted, but not by any means constantly so. The young is characterized by having the upper parts marked with large oblong spots, and the head and under parts with long narrow dashes. In both old and young the markings are of a dark warm gray, almost black in the former, which is also distinguished by the cere, beak, feet and toes being of a pale yellow or straw colour; while in the young, these parts, with the exception of the beak, are of a light livid blue. Some of the young are very white, so that they can be distinguished only by the form of the spots and colour of the naked parts. In such the spots or dashes on the head and under parts are reduced to mere lines, scarcely wider than the shafts of the feathers, and