**Supplementary file 1.** Additional information.<https://doi.org/10.5852/ejt.2024.968.2719.12501>

**Table S1.** List of characters.

|  |  |  |
| --- | --- | --- |
| 1 Postocular margin of head | (0) Gradually rounded; (1) broadly rounded; (2) neck-like constriction; (3) convex | Shape of the head posterior to compound eyes when viewed from front view that maximizes eye length. Gradually indicating the rounding continues to the posterior-most margin, whereas broadly refers to rounded lateral margins with a flattened posterior margin. Neck-like constriction refers to an abruptly narrowed postocular margin. Convex means a depression at the posterior-most margin |
| 2 Lateral eye position | (0) Distant from lateral margin of head; (1) touching or overlapping head lateral margin; (2) protruding from lateral margin of head | In a frontal view, position of the outer/lateral margin of the eye with respect to lateral margin of the head capsule. Either with outer/lateral margin of the eye distant from the lateral margin of the head (by 1/3 width of eye) or with the lateral margin of the eye touching or overlapping lateral margin of head. Protruding meaning that base of eye is attached to lateral margin of head |
| 3 Anteroposterior eye position | (0) Posterodorsal; (1) anteroventral; (2) mesad | Eye position corresponding to either the posterodorsal or anteroventral half of head. Head length measured from anterior margin of clypeus to occipital foramen, overall eye position determined by position of eye center (pinpointed as meeting point between eye height and width measured at greatest length and width). Mesad, the eye positioned at the middle of the distance of head length |
| 4 Face sculpture | (0) Uniformy foveolate; (1) smooth and shining; (2) other | Sculpture of head varies from uniformly foveolate to smooth and shining. Other means any kind of sculpture other than the two anterior, it can be striated, retculo-striated, etc. |
| 5 Erect setae on scape | (0) Absent; (1) present | Erect setae refer to those hairs clearly separated from scape surface (not adpressed or decumbent) |
| 6 Clypeal margin | (0) concave; (1) emargination present; (2) straight; (3) other | Anterior margin of clypeus with notch or indentation along medial axis, concave or any other form |
| 7 Lateral pronotum | (0) Uniformly foveolate; (1) smooth and shiny; (2) foveolate with shiny path; (3) other | Sculpture as seen in profile on the sides of pronotum can be foveolate in all the area, smooth, foveolate and smooth or any other sculpture |
| 8 Petiole peduncle | (0) Very short or indistinguished; (1) short, no more than 1.5 times longer than node; (2) large, more than 1.5 times longer than node | Petiole peduncle defined as no more than 1.5 times longer than the height of the node |
| 9 Anterior mesonotal ridge | (0) Absent; (1) present | Dorsal ridge present abutting the promesonotal suture |
| 10 Posterior margin of head | (0) Simple; (1) flanged | In some species of this genus, the posterior border of head can be simple or flanged |
| 11 Katepisternum  | (0) Uniformly foveolate; (1) smooth and shiny; (2) foveolate with shiny path; (3) striated; (4) other  | The katepisternum is variable in texture, so that in can be foveolate, smooth or a combination of both textures |
| 12 Gastral sculpture | (0) Smooth and shining; (1) other | First gastral tergite can be smooth and shinning or with any other texture, for example, striated |
| 13 Pronotal spines | (0) Absent; (1) present | A few species of this genus present spines on the pronotum, most species do not present this character |
| 14 Scape length | (0) Surpassing vertex of head by less than ¼ the length of the scape; (1) surpassing vertex of head by ¼ or more the length of scape; (2) not surpassing vertex of head | In frontal view, the scape surpasses vertex of head by a total length of ¾ or more the length of scape |
| 15 Propodeal spines | (0) Indistinguishable; (1) minute; (2) short; (3) long | In profile, anterior face of propodeum with a pair of projections that can be indistinguishable, notorious but very small or long (spines), longer than dorsal side of propodeum |
| 16 Propodeum sides | (0) In a straight angle; (1) not in a straight angle; (2) indented | In lateral view, the declivous margin of propodeum can be as a straight angle in reference to the dorsal margin or with a more obtuse angle or indented  |
| 17 Mesosoma pilosity | (0) Absent; (1) present stiff; (2) present thin | In species of this genus, erect pilosity on the mesosoma can be present or not  |
| 18 Tibia pilosity | (0) Absent; (1) present | Pilosity on tibiae in species of this genus might be present or absent |
| 19 Erect setae on gaster |  (0) Absent; (1) sparse; (2) abundant | In species of this genus, pilosity on the gaster can be present or not |
| 20 Metanotal groove | (0) Absent; (1) present | In profile, an incision between the union of the mesonotum and the propodeum  |
| 21 Promesonotal groove | (0) Absent; (1) present | In profile, an incision formed between the union of the pronotum and the mesonotum  |
| 22 Pronotum neck | (0) Absent; (1) present | The anterior border of the pronotum extends anteriorly in a somewhat kind of “neck”  |
| 23 Antennal club | (0) Absent; (1) present | One of the characters that define the genus is the presence of antennal club (three or four-segmented) |
| 24 Postpetiole  | (0) Absent; (1) present | Ant subfamilies can be separated by having one (petiole) or two (petiole and postpetiole) constrictions between propodeum and gaster |
| 25 Number of spurs on the posterior tibiae | (0) None; (1) one | Posterior tibiae with any or one spur  |
| 26 Kind of structure in the apical segments of abdomen | (0) Nozzle; (1) slot; (2) sting | Groove is the concealed structure formed between apical tergite and sternite of gaster in some ants; the nozzle is the orifice at the apex of the hypopygium and the sting is part of the venoum apparatus in some ants |
| 27 Number of antennal segments | (0) 11; (1) 12 | Ants in general, vary in the number of antennal segments. In *Pheidole* the number is twelve |
| 28 Antennal club of three segments | (0) No; (1) yes | Th antennal club when present, is generally of three segments in *Pheidole* |

Data matrix

**Table S2.** Data matrix.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Taxa/Character** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| *F. integroides* | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| *C. chartifex* | 0 | 1 | 0 | 2 | 1 | 2 | 3 | 0 | 1 | 1 | 3 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| *D. spurius* | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| *A. mexicana* | 3 | 1 | 1 | 2 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| *C. minutus* | 1 | 1 | 0 | 2 | 0 | 1 | 3 | 0 | 0 | 0 | 3 | 1 | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 |
| *P. dwyerii* | 3 | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. granulata* | 2 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. obtusospinosa* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. morelosana* | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. tepicana*  | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. coracina* | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. gouldi* | 2 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. yucatana* | 3 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. tolteca* | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. optiva* | 3 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. tethepa* | 1 | 2 | 2 | 2 | 1 | 3 | 3 | 2 | ? | 0 | 4 | ? | 1 | 1 | 3 | 1 | 2 | ? | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. primigenia* | 1 | 2 | 2 | 2 | 1 | 3 | 3 | 2 | ? | 1 | 4 | ? | 1 | 1 | 3 | 0 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 1 |
| *P. praehistorica* | 1 | 2 | 2 | 2 | 1 | 3 | 3 | 2 | 0 | 1 | 4 | 1 | 1 | 1 | 3 | 0 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 1 |