

Wilson (1990) adopted this system for their synopsis of the ant genera of the world. Furthermore, they included *Bregmatomyrma* and indicated some doubt about this system by listing this taxon as 'Formicini and Lasiini'. Agosti (1991), by describing new characters, proposed a new system. From Hölldobler & Wilson's genera he included *Cataglyphis*, *Formica*, *Polyergus*, *Proformica*, *Rossomyrmex*, *Teratomyrmex* in the *Formica* genus group, *Acanthomyops*, *Lasius* and *Myrmecocystus* in the *Lasius* group, and *Bregmatomyrma* and *Pseudolasius* in the *Pseudolasius* genus group. *Andragathus* had already been synonymized with *Paratrechina* (Agosti & Bolton, 1990b). Thus, from Hölldobler & Wilson's Lasiini and Formicini taxon, only the genera belonging to Agosti's *Formica* genus group are included in the tribe Formicini as it is diagnosed here. *Teratomyrmex* is excluded because of its asepalous proventricule (Agosti, unpubl.). This makes a sister group relationship between Lasiini and Formicini highly unlikely (Agosti, 1991).

The following characters were used in the study of formicini ants, but refer mainly to the tribal or higher level (see diagnosis of the tribe; Agosti, 1991, and in prep.): the position of the antennal articulation (Forel, 1893); the structure of the clypeal and antennal groove (Emery, 1916), the propodeal spiracle, the male genitalia (Emery, 1916), and of the proventricule (Forel, 1912; Emery, 1916, Eisner, 1957); the structure of the frontal carina, the position of the propodeal spiracle, the articulation of the petiole into the alitrunk, the relative position of the hind coxal cavity, the structure of the ventral surface of the petiole and the first gastral segment, and the pilosity of the hind tibia (Agosti & Bolton, 1990a).

Larval characters seem to be of little use to discriminate between Formicini and Lasiini (Wheeler & Wheeler, 1970).

The karyology of Formicini is only partially investigated. All of the species of *Formica* ($2n = 52, 54$; e.g. Hung, 1969; Hauschteck-Jungen & Jungen, 1976, 1983), *Polyergus* ($2n = 52$; e.g. Hauschteck-Jungen, pers. comm.; Imai, 1966) and *Cataglyphis* ($2n = 52$; e.g. Hauschteck-Jungen, pers. comm.; Imai *et al.*, 1984) so far investigated show a very consistent pattern with $2n = 52$ or 54 . This is a higher number for each of the species analysed of *Lasius* and *Myrmecocystus* (see Crozier, 1975, for a compilation of karyotypes within the ants).

Behavioural characters are not included in this study. However, a comprehensive synthesis of behaviour and ecology, including Formicini ants, which might be the starting point for comparative ethological studies, is given by Hölldobler & Wilson (1990). The same publication also includes a synopsis of revisionary studies, regional faunas and distribution of all ant genera of the world, and thus does not need to be repeated here.

During this study it became evident that all the genera included are in need of a full-scale revision. Only *Cataglyphis* has recently been revised on a worldwide base (Agosti, 1990). The identity of almost all the subgenera and species can only be guessed from isolated descriptions, and monophyly has not been demonstrated for any of the

subgenera. For the purpose of this study, all the subgenera were sunken into synonymy, and should await future cladistic analyses to establish their validity. Species groups have the further advantage of not being formally recognized by the Code, and thus it is not as important whether the group is monophyletic or a mere operational taxon.

Measurements and indices

Morphological terminology in the text follows Hölldobler & Wilson (1990). All measurements are given as a minimum, maximum and, in parentheses, the median; the unit of measurement is mm; e.g. AL 1.23–1.45 (1.40).

Alitrunk length (AL). The diagonal length of the alitrunk in profile from the point at which the pronotum meets the cervical shield to the posterior base of the metapleuron.

Head length (HL). The length of the head proper, excluding the mandibles, measured from the mid-point of the anterior clypeal margin to the mid-point of the occipital margin, in full-face view.

Head width (HW). The maximum width of the head in full-face view, measured in front of the eye.

Cephalic index (CI). $HW \times 100/HL$.

Scape length (SL). The maximum straight line length of the antennal scape excluding the basal constriction or neck to the condylar bulb.

Scape index (SI). $SL \times 100/HW$.

Wing length (WL). The maximum length of the front wing from the distalmost point on the tegulae to the distalmost point of the wing.

Wing index (WI). $WL \times 100/AL$.

This study has mainly been based on specimens available at the following institutions: BMNH, CCAC, DAAC, ETHZ, and MHNG. Additional specimens were received from the institutions mentioned below.

Depositories

BMNH: Department of Entomology, The Natural History Museum, London, U.K.; CCAC: collection of C. A. Collingwood, Skipton, U.K.; CXE: Collection of X. Espadaler, Bellaterra, Spain; DAAC: collection of D. Agosti, Uster, Switzerland; DBAUG: Departamento de Biología Animal, Universidad de Granada, Spain; ETHZ: Entomologisches Institut, Eidgenössische Technische Hochschule, Zurich, Switzerland; IEE: Instituto Español de Entomología, Madrid, Spain; IZPAN: Instytut Zoologiczny, Polska Akademia Nauk, Warszawa, Poland; MCZ: Museum of Comparative Zoology, Harvard University, Cambridge, Mass., U.S.A.; MHNG: Muséum d'Histoire Naturelle, Geneva, Switzerland; MNHP: Muséum Nationale d'Histoire Naturelle, Paris, France; MZL: Musée Zoologique, Lausanne, Switzerland; NHMB: Naturhistorisches Museum, Basel, Switzerland; ZMK: Zoologisk Museum, Copenhagen, Denmark; ZMMSU: Zoological Museum, Moscow State University, Moscow, U.S.S.R.