

New Synonymy in the Genus *Aphaenogaster* Mayr (Hymenoptera, Formicidae)

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The type specimens of *Aphaenogaster* forms described by Wheeler from Japan were re-examined. *A. verecunda* Wheeler, 1928 is newly synonymised with *A. japonica* Forel, 1911 stat. nov., and *A. famelica frontosa* Wheeler, 1928, *A. f. ruida* Wheeler, 1928, and *A. vapida* Wheeler, 1928 are newly synonymised with *A. famelica* (Fr. Smith, 1874).

Key Words: ant, *Aphaenogaster*, Japan, new synonymy.

Introduction

In his paper on Japanese and Korean ants, Wheeler (1928) described four new forms in the genus *Aphaenogaster* from Japan: *A. verecunda*, *A. famelica frontosa*, *A. famelica ruida*, and *A. vapida*. His descriptions were based upon limited material and ignored possible variation within a species. Although all the Japanese species of this genus, unlike some Southeast Asian species, are monomorphic in the worker caste, considerable variation exists in size and body sculpture within each species, and even among the members of single colonies.

Ogata (1991) mentioned that the two species and two subspecies of *famelica* described by Wheeler in 1928 [in the genus *Aphaenogaster*] have been thought to be junior synonyms of *famelica* and/or *japonica* by Japanese myrmecologists. Recently I have re-examined all the type material of the four forms described by Wheeler and confirmed that only three species of this genus occur on the main islands of Japan: *A. japonica*, *A. famelica*, and *A. osimensis* Teranishi, 1940. This agrees with the view that has been reached on the basis of morphological and karyotypic studies (Imai 1971; Nishizono and Yamane 1990; Watanabe and Yamane 1992).

Aphaenogaster japonica Forel, stat. nov.

Aphaenogaster schmitzi japonica Forel, 1911: 267 (type loc. Hokkaido; worker; type not examined).

Aphaenogaster syriaca japonica: Emery, 1921: 60.

Aphaenogaster smythiesi (sic) *japonica*: Wheeler, 1928: 101; Nishizono & Yamane, 1990: 34-35; Watanabe and Yamane, 1992: 17-18.

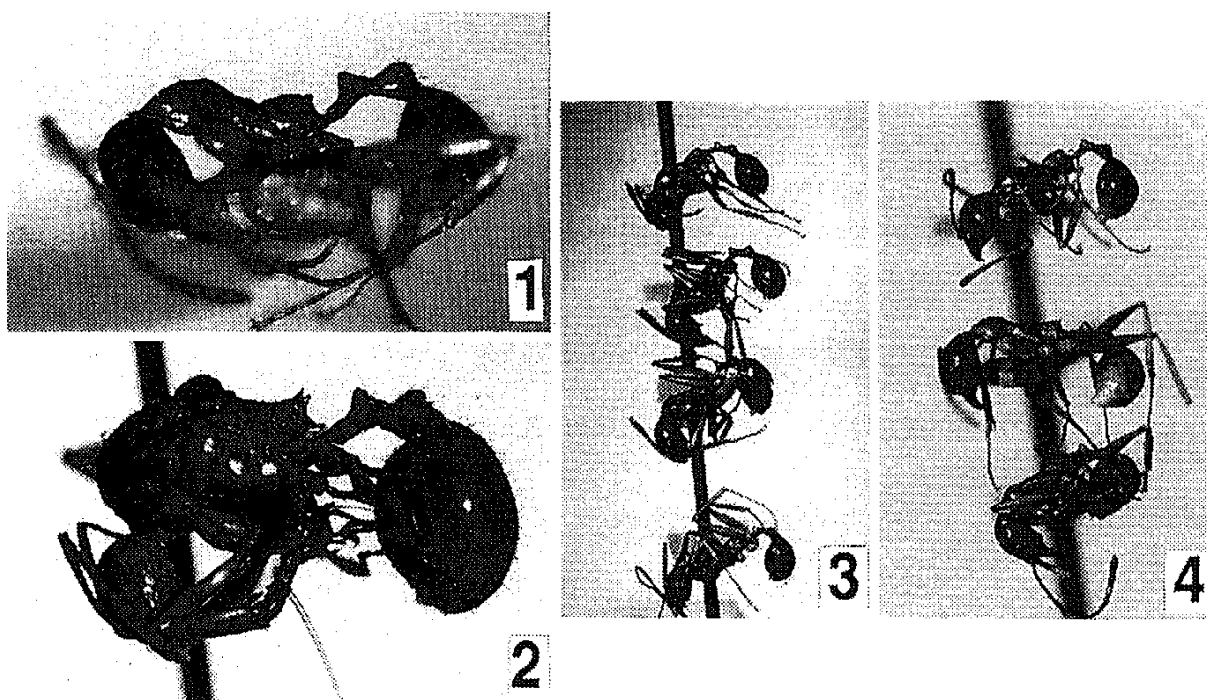
Aphaenogaster smythiesii japonica: Bolton, 1995: 73.

Aphaenogaster smythiesi (sic): Imai, 1971: 137ff (karyotype).

Aphaenogaster verecunda Wheeler, 1928: 105 (type loc. Unzen, Kiushiu; worker), syn. nov.

I examined one worker included in the type series of *A. verecunda* (Unzen, Japan, 5. 24. 25, Silvestri/ type/ Wm. M. Wheeler/M.C.Z., Type, 1-3. 20416). It is a very small worker (Tab. 1) with an appearance somewhat similar to *A. famelica*. Wheeler mentioned that the new species is very much smaller than *A. famelica* but with a head of a similar shape. However, in smaller workers of *A. japonica* the head tends to be proportionally narrower behind the eyes than in larger workers; the head shape in smaller workers is, thus, similar to that of *A. famelica*. The relative lengths of the syntype's antennal scape and hind femur, the most reliable characters distinguishing between some Japanese species, falls well within the range of *A. japonica*. All the other features stated by Wheeler also agree with those observed in smaller workers of *A. japonica*. The syntype examined is the smallest one I have ever seen of *A. japonica*, so it may have come from an initial colony and belonged to the first batch of workers.

Another problem concerns the relation of *japonica* to *smythiesii*; the former has been treated as a subspecies of the latter since Wheeler (1928). I have examined the type series of *Aphaenogaster smythiesii* (Forel, 1902) in the Forel Collection at the Natural History Museum, Geneva, and found that it is a species with a distinct worker dimorphism and gigantic queens (ca. 18 mm in body length vs. only around 12 mm in *japonica*). Although the minor workers are somewhat similar to those of *japonica*, the above mentioned fact alone indicates strongly that these two are separate species.



Figs 1-4. Type material of *Aphaenogaster* forms described by Wheeler from Japan. 1, *A. verecunda* (worker, Unzen, Japan; 5.24.25, Silvestri; MCZ, Type, 20416). 2, *A. famelica ruida* (female, Michino-o, Japan; 6.3.25, Silvestri; MCZ Type, 20599). 3, *A. famelica frontosa* (Arashiyama, Hondo, Japan; v.19.25, Silvestri; MCZ Type, 20598). 4, *A. rapida* (Michino-o, Japan; 6.3.25, Silvestri; MCZ, Type, 20615).

Table 1. Head width, head length, scape length, and hind femur length in the type material of *Aphaenogaster* forms described by Wheeler (in mm)

Forms	Head width*	Head length	Scape length	Hind femur length
<i>verecunda</i> (w**)	0.70	0.84	0.98	1.03
<i>frontosa</i> (w)	0.99	1.24	1.56	1.83
ditto	1.06	1.29	1.73	1.98
ditto	1.08	—	1.75	2.05
ditto	1.06	—	1.73	1.98
ditto	1.05	1.33	1.68	1.89
<i>rudia</i> (q**)	1.65	1.73	1.93	2.48
<i>?rudia</i> (w)	1.18	1.40	1.80	2.09
ditto	1.23	1.41	1.80	2.08
<i>rapida</i> (w)	0.76	0.98	1.29	1.40
ditto	0.88	1.09	1.55	1.68
ditto	0.79	0.96	1.38	1.48

*including eyes **w: worker, q: queen

Aphaenogaster famelica (Fr. Smith)

Ischnomyrmex famelicus Fr. Smith, 1874: 405 (type loc. Hiogo, Japan; worker; type not examined).

Aphaenogaster famelica: Wheeler, 1928: 102-104; Imai, 1971: 137ff (karyotype); Nishizono and Yamane, 1990: 26-29 (queen, worker, male); Watanabe and Yamane, 1992: 17 (worker); Bolton, 1995: 69.

Aphaenogaster famelica frontosa Wheeler, 1928: 104 (type locs. Arashiyama, Hondo; Unzen, Kiushiu; Kamakura, Hondo; worker), syn. nov.

Aphaenogaster famelica ruida Wheeler, 1928: 104 (type loc. Michino-o, Nagasaki; queen); Ogata, 1991: 86; syn. nov.

Aphaenogaster ruida: Collingwood, 1976: 302; Bolton, 1995: 71.

Aphaenogaster vapida Wheeler, 1928: 105-106 (type loc. Michino-o, Nagasaki; worker), syn. nov.

I have examined the type series of all the forms described by Wheeler and compared them with numerous specimens of *A. famelica* collected from colonies in southwestern Japan. The type of *A. famelica ruida* (dealated queen) is considered to fall well within the range of variation of *A. famelica*. The types of *A. famelica frontosa* and *A. vapida* and putative workers of *ruida* from Saitama represent various size classes of a single species, *A. famelica*. In this species the head tends to become relatively longer, the body sculpture weaker, and the propodeal spines relatively shorter in smaller specimens.

Discussion

Among the three species occurring on the main islands of Japan, *A. osimensis* is distinguished easily from the other two in that it has a clypeus with distinct striae near the anterior margin, mandibles with many small denticles on their basal

margins, and an almost unsculptured pronotum and anterior part of the mesonotum in the worker. However, *A. japonica* and *A. famelica* are sometimes difficult to distinguish. In its general shape, *A. famelica* is larger and more slender, and has relatively longer antennae and legs than *A. japonica*. Furthermore, in *A. japonica* the body sculpture is stronger and the mesonotum has a peculiar angular prominence in its anterior portion, this latter state forming the basis for the previous consideration of *japonica* as a subspecies of *A. smythiesii*. However, in all these characters, smaller specimens of *A. japonica* are similar to larger specimens of *A. famelica*, except in body size. This means that we must compare specimens of the same size class. The most reliable character may be the relative length of the antennal scape; it is generally more than 1.5 times longer than the head width in *A. famelica*, whereas it is much less than 1.5 times as long in *A. japonica*, although a few exceptions have been found in *A. famelica*.

In Wheeler's era taxonomists encountered much difficulty in getting sufficient material from remote places; many subspecies, varieties and forms were described that merely represented intraspecific variations. Even today, museum taxonomists working remotely from the sites where their material was collected often cannot get information that is crucial for recognizing closely related biological species (Yamane 1996) and, thus, their approaches tend toward typology. I would like to emphasize that the making of a complete inventory of a local fauna with ecological and behavioral information will be extremely important for the next generation of ant taxonomy.

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