Smithistruma filitalpa W. L. Brown, an Indiana Dacetine Ant (Hymenoptera: Formicidae)

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Abstract

Smithistruma filitalpa is a dacetine ant found in Indiana, although related forms are old world and tropical. *Strumigenys* is believed to be the ancestral genus of *Smithistruma* with the latter including forms with short mandibles, while the former have long mandibles. Small size, small nest populations, and slow movement of the ant are among factors that have caused *S. filitalpa* to be largely overlooked. Berlese funnel collections have shown that this species is not as uncommon as previously thought. Thirty-three specimens of *Smithistruma* were taken by pitfall trapping in an abandoned surface mine. On the basis of 6 workers from from these ants, which were determined by the author of the species to be *S. filitalpa*, eight additional workers were considered as belonging to the same species. Although not determined to species, 15 sexual forms and four other workers are also believed to belong to the genus *Smithistruma*. It was determined that 75-80 percent of the areas from which the ants were taken represented open or bareground situations. These findings support the supposition that *S. filitalpa* is an ant of open areas; also, its presence is probably related to the presence of collembolans upon which it feeds. The 6 specimens of *Smithistruma filitalpa* submitted for determination have been included in the Museum of Comparative Zoology collection of dacetine ants, Cornell University.

Introduction

Smithistruma filitalpa is a species of the Dacetini, a large tribe of unusual appearing ants of the subfamily Myrmicinae. The subfamily is characterized by those ants having a pedicel of two segments between the thorax and abdomen; also, they possess a sting. Dacetine ants, according to Brown (2) may be recognized as having: 1) less than six segments in the antennal funiculus; white spongy-like appendages or thin-layered lateral wings on one or both sides of the pedicel; or 2) having a flattened pear-shaped head which is narrowed anteriorly with a broad, deep occipital cleft; mandibles linear, each with two or three large apical teeth, as well as an oblique, often hidden tooth or spine at the inner basal border; or 3) having a combination of the characteristics noted in 1) and 2).

The Dacetini are widely distributed throughout the world and constitute generic complexes in Neotropical, Australasian, Ethiopian, as well as Nearctic regions (2). According to Wilson (6) the distribution of the genus *Smithistruma* includes Asia, Australia, and the New World Tropics; however, it is represented in Nearctic regions as well (2). The subgenus *Smithistruma* is almost cosmopolitan (4).

The ancestral genus of *Smithistruma* W. L. Brown, is thought to be *Strumigenys* F. Smith, which is the largest genus of the Dacetini. The *Strumigenys* complex includes 16 genera (2) one of which, *Smithistruma*, was erected by Brown in 1949. Ants of this genus are recognized as "short mandibulate" forms in contrast to the "long mandibulate" forms which are more typical of *Strumigenys*.

Morris (3) listed four species of *Strumigenys* as probably occurring in Indiana. Since these were "short mandibulate" ants they rightfully belong to *Smithistruma*. Brown (2) has recorded 15 species of this genus among the states of Indiana, Kentucky, Illinois, and Ohio. Except for one, all of the species belong to the subgenus *Smithistruma*. Illinois and Ohio are each represented by 13 of the 15 species; one was reported from Kentucky and 6 from Indiana. *Smithistruma filitalpa* was reported only from Indiana (2). The four species noted by Morris are included in the 15 recorded by Brown. Although *S. filitalpa* was cited in 1967 as one of nine ants recently recorded in the state, no reference to habitus was made (5). Figure 1 shows some of the characteristics of dacetine ants as represented by this species. Shown are the mandibles with apical teeth; pyriform head; 5-segmented antenna; and spongiform processes on the declivity of the epinotum, petiole, and postpetiole. Part of the head sculpture is shown in its upper left region.

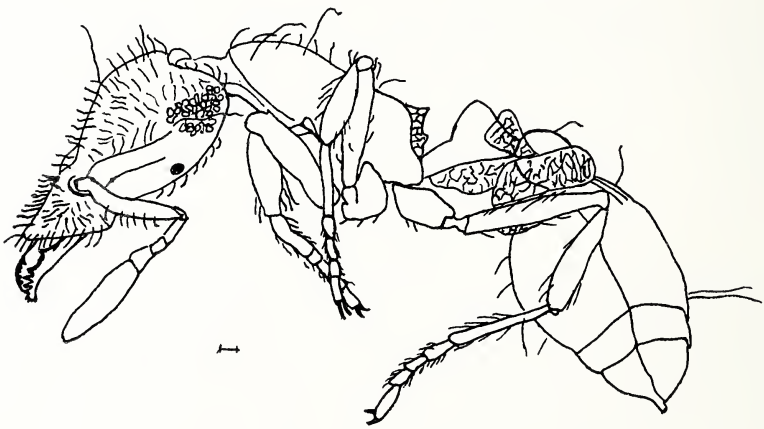

FIGURE 1. Smithistruma (S.) filitalpa *Brown showing some characteristics of dacetine ants. Partial sculpturing of head, upper left.*

Some of the biology of ants of *Smithistruma* is known, but much needs to be learned about their ecology, including that of *S. filitalpa*, according to Brown (personal communication). It has been established that *S. filitalpa* and the majority of higher dacetines are predaceous and feed chiefly upon collembolans and other soft-bodied anthropods, as noted in Brown (2) and Wilson (6). With increased collecting of species of *Smithistruma*, habitat preferences have likewise become better known. Thus, Brown notes that some species are found in open country and have been taken in the berlestates of *Andropogon* clumps. In southern Indiana he found the closely related species, *S. talpa* mainly in duff under red cedar in clearings and in old fields (personal communication).

Various factors are related to previous dearth of information about *Smithistruma filitalpa* and related species. They are small ants which move very slowly. Also, because of being light ferruginous color and tendency to feign death, they are not easily seen; in addition, colonies

are small and usually well concealed (2). It was not until berlesates of habitat materials were studied that the more common occurrence of these ants was recognized. Brown's revision of the dacetine ants is the only comprehensive work on this tribe, and is therefore the primary reference of this report.

Methods

Ants belonging to *Smithistruma* referred to here were taken in pitfall traps in the spoil banks of a defunct stripmine located near Centenary, Indiana. The specimens appeared in collections made in connection with a related study on ant ecology. Originally, a worker, dealate female, and alate male were submitted to D. R. Smith, Agricultural Research Service, U.S.D.A., for identification. In the return communication, a qualified determination of *Smithistruma filitalpa* Brown was received. Closer examination of similar appearing ants showed a total of 30 additional specimens which included 17 workers, 11 females, 1 male and 1 bilateral gynandromorph. Only the workers are reported here. To firmly establish identity, six workers believed to be *Smithistruma filitalpa* were sent to Brown, after obtaining data on measurements following the method given in his revisionary work (2). Brown's reply confirmed the identification. Among the remaining workers were three that clearly were not this species; also, two unidentified workers were received from Jack Hart, Earlham College, which he had taken during studies on the Collembola, near Connersville, Indiana. One of these, along with three workers, were measured and tentatively identified before being submitted to Brown for determination. Brown noted that because of the poor condition of the ants no positive identity could be made (personal communication). Presence, arrangement, and form of clypeal and body hairs are very important diagnostic factors. The hairs are easily dislodged or matted and for this reason, Brown recommends mounting specimens on points, rather than storing in alcohol.

Generally, the method of measuring ants followed that of Brown (2), except that a stage micrometer rather than a squared ocular disc was used. Also, Brown's specimens were dry-mounted, while in this study ants were examined in alcohol or methylcellulose, the latter not recommended if specimens are to be pinned. A total of eight basic measurements were made on each of 14 worker specimens.

Results

Five of the eight measurements pertinent to this paper are given in Table 1. The five correspond to those for species of *Smithistruma* in Brown's revision (2). They represent averages compared with measurements given for Brown's holotype worker (1).

The differences for each corresponding value are small from which it may be determined, along with the description of the Brown's specimen, that the workers are the same species as the holotype.

Brown (2) suggests that *S. filitalpa* is an ant of open areas which characteristic is typical of the spoil banks from which ants in this study were taken. Vegetation consists chiefly of weeds in addition to scattered

TABLE 1. *Comparison of average measurements of 14 workers of* Smithistruma (S.) filitalpa *with corresponding measurements of the holotype.*

	Workers	Holotype
Total Length—mm	2.25	2.06
Head Length—mm	0.55	0.54
Alitrunk (WL)—mm	0.53	0.52
Cephalic Index (CI)	65.00	66.00
Mandibular Index (MI)	16.70	17.00

CI—Maximum head width/Head length X 100
MI—Mandibular length/Head length X 100

small trees. Of the four separate sites from which the specimens were taken, 75-80 percent of their areas was determined to be open or bare-ground. (Unpublished doctoral thesis.)

Like other species of the genus, *S. filitalpa* is likely to be found where collembolans are abundant. In this study, trap catches included many of these insects. Since they are a principal food source, their presence is thought to assure the presence of the ants (2).

The six specimens of *Smithistruma filitalpa* submitted for determination have been included in the Museum of Comparative Zoology collection, Cornell University, and according to Brown, "are useful towards establishing that *S. filitalpa* is a good species with its own distribution and variation" (personal communication).

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