

A NEW SPECIES OF *BASSUS* (HYMENOPTERA: BRACONIDAE:
AGATHIDINAE) PARASITIC ON *SAMEA MULTIPLICALIS*,
A NATURAL CONTROL AGENT OF WATERLETTUCE

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ABSTRACT

A new species of braconid (Hymenoptera: Braconidae: Agathidinae), *Bassus agathoides*, is described from Florida. The phylogenetic position of this species within *Bassus* is discussed. It is a parasitoid of *Samea multiplicalis* (Guenee) (Lepidoptera: Pyralidae), a natural control agent of waterlettuce, *Pistia stratiotes* L. (Araceae), an important aquatic weed. Characters to distinguish *B. agathoides* from other species of Nearctic *Bassus* are provided.

Key Words: Weed biological control, systematics, tritrophic interactions, *Agathis*

RESUMEN

Una nueva especie de braconido (Himenóptera: Braconidae: Agathidinae), *Bassus agathoides*, es descrita de la Florida. La posición filogenética de esta especie dentro de *Bassus* es discutida. Es un parásito de *Samea multiplicalis* (Guenee) (Lepidóptera: Pyralidae), un agente de control natural de la lechuga de agua, *Pistia stratiotes* L. (Araceae), una maleza acuática importante. Características para distinguir a *B. agathoides* de otras especies de *Bassus* cercanos al ártico son proveídos.

In Florida, *Samea multiplicalis* (Guenee) (Lepidoptera: Pyralidae) is the most common natural control agent associated with waterlettuce, *Pistia stratiotes* L. (Araceae), an aquatic weed that can affect navigation and flood control. *S. multiplicalis* is native to South America and the southeastern United States, and its larval stages can cause severe damage to *P. stratiotes* (Wheeler and Halpern 1999).

Knopf and Habeck (1976) reared several parasitoids from specimens of *S. multiplicalis* from Florida, including three ichneumonoids and a tachinid fly. Further research by G.S. Wheeler (USDA/ARS Aquatic Weed Research Unit, Ft. Lauderdale, FL, personal communication) suggests that the most common parasitoid attacking Florida populations of *S. multiplicalis* is a braconid wasp in the subfamily Agathidinae. In their rearings, 13.4% of 732 *S. multiplicalis* larvae were consumed by this agathidine wasp. This was also one of the parasitoids reared from *S. multiplicalis* by Knopf and Habeck (1976). Although Knopf and Habeck placed the parasitoid in the Agathidinae, they referred to it as an undetermined species of *Agathis*. Our study describes and names the parasitoid, and briefly discusses the phylogenetic relationship of this species with other Agathidinae species. It is hoped that this taxonomic study will facilitate future research into this economically important tritrophic system.

MATERIALS AND METHODS

The description is of the holotype female with variations in parentheses. Morphological terminology follows Sharkey (1996) and Sharkey and Wharton (1997).

DESCRIPTION

Bassus agathoides, **NEW SPECIES**

HOLOTYPE FEMALE: *Length.* 4.73 mm (females 3.63-4.73 mm, males 3.80-4.53 mm)

Color. Flagellomeres (with antennae directed anteriorly) dark brown dorsally, fading to dark orange ventrally (ventrally ranging from entirely black to yellow); anterior orbit of eye black, the posterior orbit orange (ranging to entirely black); mouthparts pale yellow with black highlights, remainder of head black dorsally with orange patches laterally (ranging from entirely black to mostly orange with dark highlights); fore leg orange with tarsus darkened distally; middle leg orange with tibia darkened distally, tarsomeres mostly dark; hind coxae dark orange (ranging to nearly black, especially in males); hind femur dark orange (ranging to black with some orange, especially in males); basal black band present on hind tibia; hind tibia black in distal half, otherwise orange; wings clear; mesosoma black with orange tegula (ranging from

black with black tegula to black with orange highlights, often with an orange spot on the mesopleuron); metasoma pale yellow ventrally (ranging to dark orange); with tergum 1 entirely black, tergum 2 black in the posterior half and orange anteriorly (or black with only the anterior margin orange), tergum 3 black with orange posterior margin, remaining terga orange with dark highlights.

Head. Number of flagellomeres = 29 (27-30); ratio, distance between ocellus and compound eye to distance between lateral ocelli = 1.2 (1.1-1.3); temple not bulging as viewed dorsally (*tm*, Fig. 1); ratio, malar space to eye height = 0.57 (0.50-0.69); gena rounded posteroventrally (*ge*, Fig. 2); median ridge connecting face and median ocellus present between antennae (*mr*, Fig. 1); interantennal space raised to converge on single point anteromedially (Fig. 1); antennal depressions shallow (*ad*, Fig. 1); median line between antennae without leather-like coriarius sculpturing.

Mesosoma. Bump of propleuron absent; notaulus crenulate to punctate (ranging to weakly punctate) along entire length (*na*, Fig. 3); posterior semicircular depression of scutellum absent; posterior transverse ridge of scutellum weak (*pr*, Fig. 3), or absent; posterior surface of scutellum rugose (*ps*, Fig. 3); metapleuron granulate (*mp*, Fig. 4); propodeum evenly rugose (Fig. 5); propodeal pseudosternite without strong transverse carina; hind coxal cavity closed, with a complete sclerite separating it from metasomal cavity (*cc* and *mf*, Fig. 6); ratio, distance between the hind coxal cavity and metasomal foramen to the diameter of the hind coxal cavity = 0.22-0.26 (hind leg not removed from holotype).

Legs. Ratio, hind femur length to hind femur width = 4.20 (3.82-4.49); spines of foretibia absent; hind tibia with eight spines (6-10) (*sp*, Fig. 7); basal lobe of tarsal claws absent (*tc*, Fig. 8).

Wings. Last abscissa of RS vein of forewing weakly curved (RS, Fig. 12); basal portion of free distal abscissa of CU of hind wing tubular to nebulus (Cu, Fig. 12).

Metasoma. Pair of longitudinal carinae on median tergum 1 absent; ratio, length of median tergum 1 to apical width of median tergum 1 = 1.04 (1.03-1.18); median terga 1, 2, and 3 granulate (Figs. 9, 10, and 11); ratio, length of ovipositor to length of metasoma = 1.64 (1.49-1.88); ovipositor sheath narrower than apex of tibia.

Hosts and Biology. First instar caterpillars of *Samea multiplicalis* (Guenee) (Pyralidae) are attacked and the parasitoid pre-pupa emerges from the last larval instar of the host (Wheeler, unpublished data).

Etymology. The specific epithet refers to the fact that this species has several features that are convergently present in many species of *Agathis* (see Discussion).

Material Examined. Holotype Female, USA: Florida: Palm Beach Co., 27-IX-96 (United States National Museum). Paratypes, USA: Florida: 16 females, 12 males, Palm Beach Co., 27-IX-96. 8 females, 3 males, Marion Co., 18-IX-96 (paratypes are deposited in the United States National Museum, the Florida State Collection of Arthropods, Gainesville, FL, and The Insect Collection of the Department of Entomology at the University of Kentucky).

DISCUSSION

Bassus agathoides has several features that are sometimes associated with species of *Agathis* and other Agathidini. These include a somewhat narrow, rostriform face (Fig. 2), and the lack of a basal lobe on the tarsal claws (*tc*, Fig. 8) (Sharkey 1991). The wide sclerite between the hind coxal cavities and the metasomal foramen (*cc* and *mf*, Fig. 6) as well as the reduced size of the third labial palpomere (*pa*, Fig. 2) preclude placement in the genus *Agathis* (Sharkey 1991). The complex rugose propodeal sculpturing exhibited by *B. agathoides* (Fig. 5) is not found in species of *Agathis*, but is common in *Bassus* species (Sharkey 1991). Similarly, the distinct granulate sculp-

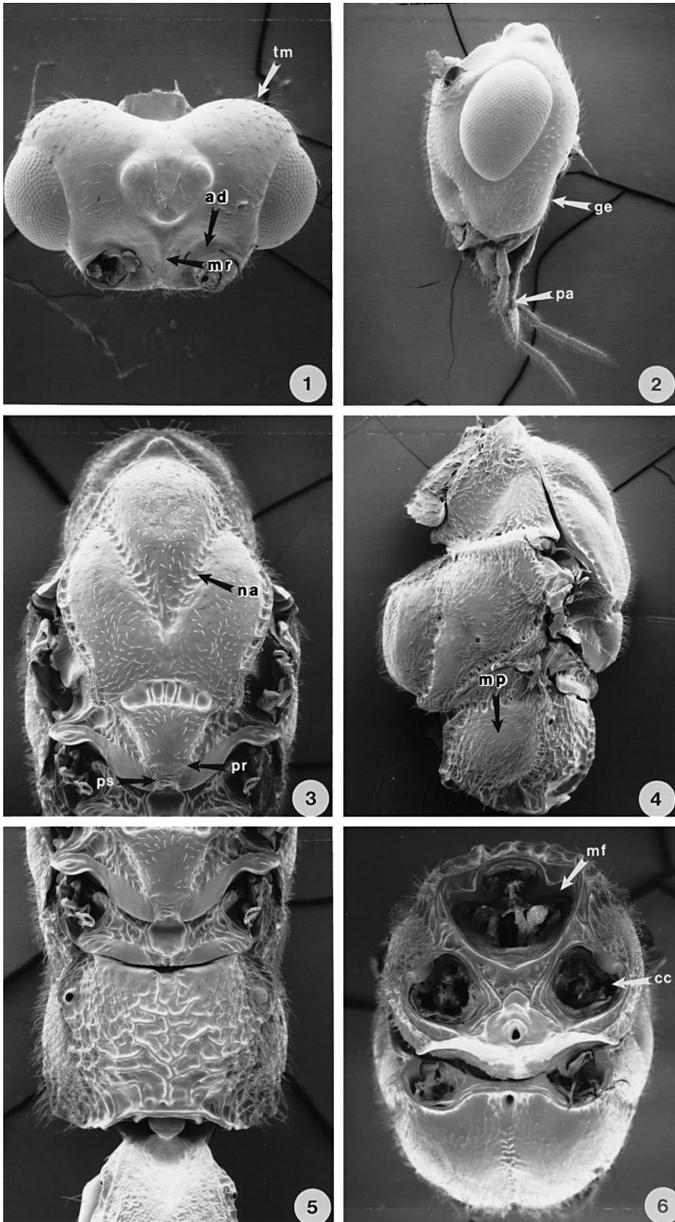


Fig. 1. Dorsal aspect of head; tm = temple; ad = antennal depression; mr = median ridge. Fig. 2. Lateral aspect of head; ge = gena; pa = third palpomere. Fig. 3. Dorsal aspect of mesonotum; na = notaulus; pr = posterior transverse ridge of scutellum; ps = posterior surface of scutellum. Fig. 4. Lateral aspect of mesosoma; mp = metapleuron. Fig. 5. Dorsal aspect of propodeum. Fig. 6. Posterior aspect of mesosoma with legs and metasoma removed; mf = metasomal foramen; cc = coxal cavity.

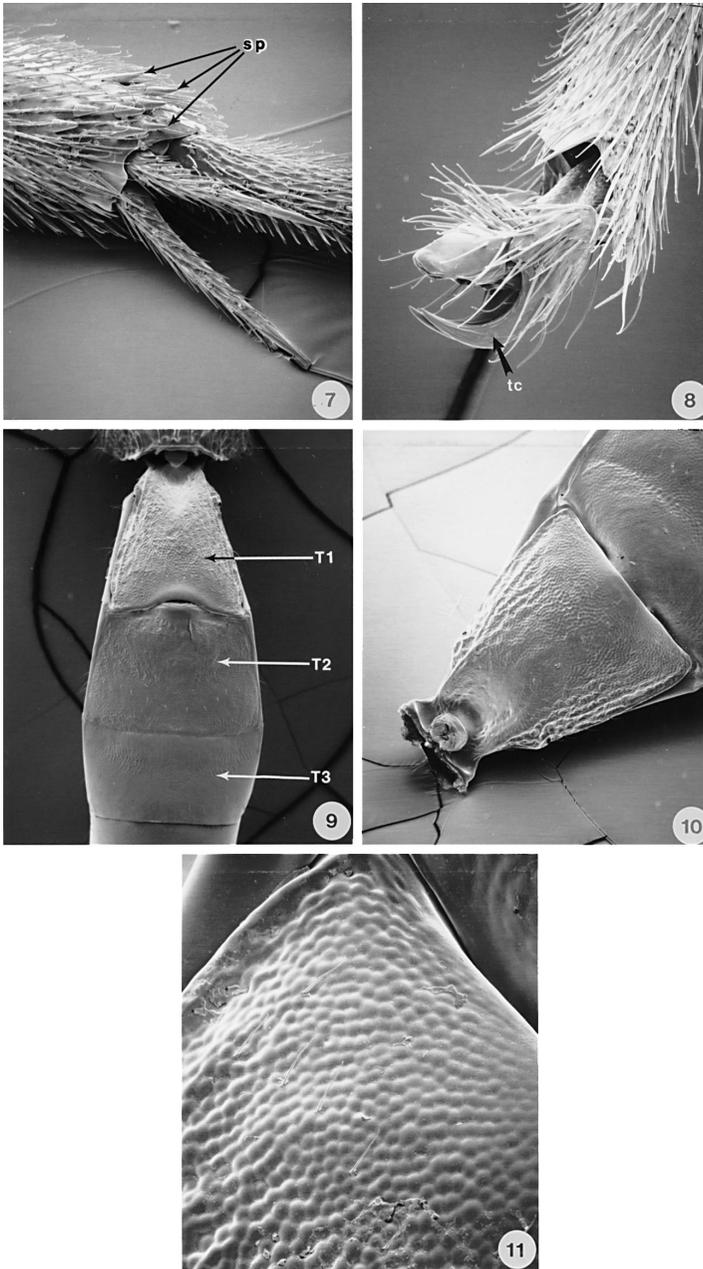


Fig. 7. Apex of third tibia; sp = spines. Fig. 8. Apex of Tarsus; tc = tarsal claw. Fig. 9. Dorsal aspect of median terga 1, 2, and 3. T1 = median tergum 1; T2 = median tergum 2; T3 = median tergum 3. Fig. 10. Dorsal aspect of median tergite 1. Fig. 11. Surface detail of median tergite 1.

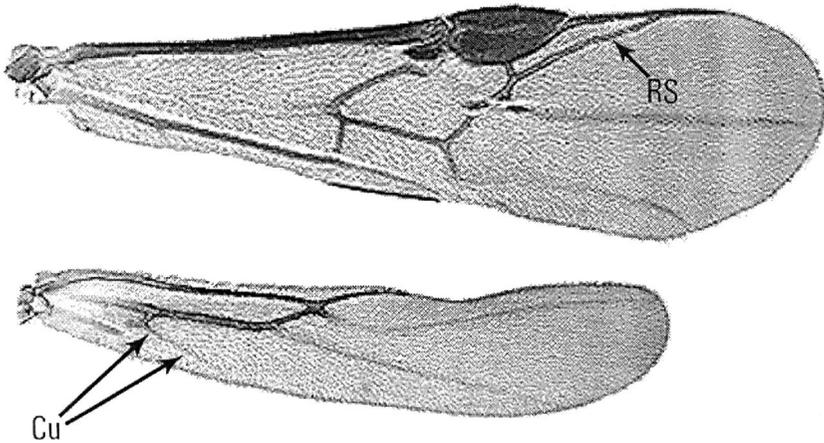


Fig. 12. Front and hind wings.

turing on metasomal terga 1, 2, and 3 (*T1*, *T2*, and *T3*, Fig. 9) and especially on the first metasomal tergum (Figs. 10 and 11) is present on many other species of *Bassus*, including *B. cintus* (Cresson), *B. discolor* (Cresson), and *B. agilis* (Cresson), but is unknown in *Agathis*. Based on outgroup analysis, this granulate sculpturing is a derived character state within *Bassus* and may define a monophyletic group.

B. agathoides runs to couplet 36 in the key to the Nearctic species of *Bassus* (Muesebeck 1927). The simple tarsal claws, lacking basal lobes (*tc*, Fig. 8), distinguish *B. agathoides* from all *Bassus* spp. in couplet 36 and following in the Muesebeck's key.

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