**ERIGERON, A HOST PLANT GENUS OF TEPHRTIDS (DIPTERA)**

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**ABSTRACT**

Two female hymenopterous parasites were reared 6 June 1966 from *Trupanea actinobola* (L.) feeding upon *Erigeron strigosus*. Dr. B. D. Burk, Entomology Research Division, USDA, identified both as *Heteroschema punctata* (Ashm.) Family Pteromalidae.

**INTRODUCTION**

Tropical Florida offers an excellent opportunity for entomologists to study the host plants and other aspects of the biology and life history of many seed-feeding insects. The diversity of neotropical plant species within the family Compositae of south Florida and the association of seed-feeding tephritids on these composites interested the author, and he undertook some research on the subject in the southern peninsular area of Florida.

Benjamin (1934), in a rather complete and comprehensive discussion on the Florida tephritids, cited distribution data on the life history of seed-feeders and many host plants in the family Compositae. Benjamin discussed the genus *Erigeron* as a host for several tephritids; however, some information on the life history and larval host plant data remained incomplete concerning the Florida tephritid study. Much of Benjamin's research and findings will be used in this paper to clarify certain aspects of the author's study concerning tephritid infestations of the genus *Erigeron*.

**GENUS ERIGERON**

Small (1933) cites the genus *Erigeron* L. as "An annual, biennial or, perennial, caulescent, aster-like herb." Small also cites the various species of *Erigeron* and their habitats; he provides information on the following species: *E. verna* (L.) T. and G., *E. quercifolius* Lam., *E. philadelphicus* L., *E. annuus* (L.) Pers., and *E. ramosus* (Walt.) B.S.P. Small gives the following information regarding *E. ramosus*: Synonyms include other daisy fleabanes referred to in literature as *Erigeron strigosus* Muhl. and *Erigeron strigosus* Muhl. var. *beyrichii* (Fisch and Mey.) T. and G. Dr. Kenneth B. Langdon, Nematologist and Botanist, Division of Plant Industry, Florida Department of Agriculture, determined the hosts of author's tephritid infestations as *Erigeron strigosus* Muhl. var. *beyrichii* (Fisch and Mey.) T. and G. This will be the plant species referred to in the author's rearing records of tephritids.

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Small stated that *E. ramosus* may be found along the roadsides, fields, woods, and thickets throughout North America. Foote and Blanc (1963) reported *Neaspilota brunneostigmata* Doane, and *Trupanea jonesi* Curran reared from *Erigeron* spp. in California. They also reported collections of *Tephritis araneosa* (Coquillet) and *T. ovatipennis* Foote on *Erigeron* spp. in California.

**Genus Neaspilota**

The following information is taken from Benjamin's (1934) report on the genus *Neaspilota* in Florida associated with the seedheads of such plants as the genus *Erigeron*.

Benjamin discussed the smaller adult specimens of *Neaspilota* and reported that the reason for some specimens being small in size was possibly the result of their feeding in the larval stages within the seedheads of some smaller flowering plants such as species of *Erigeron*. Such small specimens were found to have the frons much sunken, and their heads appeared to have a shape quite distinct from those normal adults noted to have fed in the larval stages within the seed-heads of some larger flowered host plants. Benjamin subsequently noted throughout a reared series of *Neaspilota* adults from seedheads of larger flowering plants some adults having the same morphological characteristics, such as size, as those specimens reared from *Erigeron*.

Adult specimens of *Neaspilota* from any single locality and single species of a given host-plant tend to form colonies according to Benjamin. The species may be identified by slight morphological characteristics such as a certain wing shape, coloration, quantity of black in the wing stigma, or number of black markings on the abdominal segments of adult *Neaspilota* specimens. Slight differences of the abdominal markings might result in the descriptions of various species. Benjamin stated that *Neaspilota* species seem to intergrade often when several species are reared from the same host-plant. When reared from slightly different localities, intergraded forms of *Neaspilota* also appeared. The intergraded adult forms may occur when several series are obtained from similar, but distinct, host plant species, for example, as those of *Chrysoptis*.

**Collections and rearing records of Neaspilota species:**


*Vernonia* sp. Kansas City, Kans., 12 Aug. 1965 (C.E.S.). Several adults were reared from ironweed seedheads. *Neaspilota* sp. Same host,
Stegmaier: Erigeron, Host Plant Genus of Tephritids

Lawrence, Kans., 12 Aug. 1965. (C.E.S.). Two adults were swept from the flowers. Neaspilota sp.


Neaspilota dolosa Benjamin

Benjamin (1934) found larvae of N. dolosa feeding singly within the seedheads of Heterotheca subaxillaris (Lam.) Britton and Rusby. Short series have been reared from Sideranthus megacephalus (? author), Erigeron ramosus (Walt.) B.S.P., and E. vernus (L.) T. and G. He stated that dolosa adults reared from both species of Erigeron are compact and on an average are much smaller sized specimens than those reared from seedheads of Heterotheca. Furthermore, the stigma of N. dolosa seemed to be more contrastingly marked, with smoky black being more frequently located basally. He theorized that the smoky black markings were the result of a different host.

Collections andrearings of N. dolosa were reported from the following Florida localities: Orlando, Florida City, Lockhart, Mount Dora, Leesburg, Wiersdale, Clermont, Fairvila, Rocky Point, Cocoa, and New Port Richy.

Florida rearing records and collections of Neaspilota dolosa Benjamin:


Heterotheca subaxillaris (Lam.) Britton and Rusby. Hialeah, Fla., 22 July 1966 (C.E.S.). Two males were swept from the flowers of H. subaxillaris. Same host, 24 July 1966 (C.E.S.). Two males and two females were swept from the flowers of this plant.

Heterotheca sp. Miami, Fla., 14 Sep. 1960 (C.E.S.). The first specimen, a female, was captured by hand from the flowers of Heterotheca. Dr. Richard H. Foote replied in personal communication that the locality was rather far south for Neaspilota dolosa.

Neaspilota achilleae Johnson

Benjamin (1934) recorded the host of N. achilleae as the flowers or seedheads of a large number of Compositae. The preferred host plants are possibly the various species of Hieracium. Benjamin stated that reared adults were known from the following plants: Hieracium argyraeum Small, H. gronovii L., and H. scabrum Michx. Other known hosts include Sericocarpus acutisquamosus (Nash) Small, Aster carolinianus Walt., A. concolor L., Chrysopsis latifolia (author not located), C. microcephala Small, C. oligantha Chapm., Erigeron ramosus (Walt.) B.S.P., and E. vernus (L.) T. and G. Dr. Kenneth Langdon stated in his critical review of this paper that "Chrysopsis latifolia is of uncertain standing and place-
ment. It is virtually impossible to be certain what species the original author had. . . ."

*Neaspilota achilleae* is recorded from the northern half of Florida, Massachusetts, Pennsylania, New Jersey, and Georgia. The author has not yet swept nor reared the species from the greater Miami area of south Florida.

*Proccictchares australis* ALDRICH

*Procccidochares australis* is reported to have been reared from larval infestations of galls on *Erigeron pusillus* Nutt., and on *Heterotheca subaxillaris* (Lam.) B. and R. Benjamin (1934) stated that the gall infestations made by *australis* were found more frequently on *Heterotheca*.

The tephritid galls were observed to be on the more succulent stems of *Heterotheca*; however, galls were known (or are known) from the more woody stems. *P. australis* also forms galls on the flowers of its host plants, and as many as six or seven galls have been found on a single plant. Each gall may contain from two to eight larvae or pupae. The species is known from Texas and from many localities in Orange County, Brooksville, and Orlando, Florida. It has not been previously reported from south Florida.

**South Florida Collections of Proccidocharaes australis ALDRICH:**

*Heterotheca subaxillaris* (Lam.) B. and R. Hialeah, Fla., 11 June 1966 (C.E.S.). Three males were swept from the flowers. Same host, Hialeah, 12 July 1966 (C.E.S.). Two males and one female were swept from leaves and flowers of this plant. Same host, Hialeah, 15 July 1966 (C.E.S.). Three empty pupal cases and a gall fragment were collected and donated to the U. S. National Museum Collection.

*Trupanea actinobola* LOE

Benjamin (1934) reported that the larvae of *Trupanea actinobola* are known to infest the seedheads of many flowering composites. A study of the life history revealed that rarely more than a single larva was known to feed within one flowering seedhead. The terms flowerhead and seedhead are considered synonymous by the author and are used interchangeably in this paper. Benjamin stated that no larvae of *actinobola* were ever found infesting the tender tips of non-flowering plants and that no infestations are known from the flower buds of their host plants.

The hosts include seedheads of such plants as *Erigeron vernus* (L.) T. and G., *E. quercifolius* Lam., and various species of goldenrod or *Solidago*. Benjamin also noted from one to three larvae were reared from the following host plants: *Aster adnatus* Nutt., *A. carolinianus* Walt., *Actinopappus* (Pursh), *Coreopsis* sp., and *Hieracium* sp.

Foote (1965) reported the distribution of *T. actinobola* as, "Idaho to Mass., s. to Calif., n. Mexico, and Fla." Foote (1960a) records *Solidago chapmanti* T. and G., and *S. serotina* (author not located) as larval host plants. Foote (1960b) also reported a single male specimen of *actinobola* from Grand Bahama Island. He stated that *actinobola* was regarded by
Stegmaier: Erigeron, Host Plant Genus of Tephritids

Benjamin as a species complex. Foote and Blanc (1963) cite collections of the species from California.

Florida rearing records and collections of Trupanea actinobola Loew:

Aster simmondsii Small. Hialeah, Fla., Nov., 1964 (C.E.S.). Seventeen adults were reared by the author from the flowerheads of this wild native composite. Dr. Richard H. Foote (personal communication) noted this as a new host record for T. actinobola.

Erigeron strigosus Muhl. var. beyrichii (Fisch and Mey.) T. and G. Hialeah, Fla., 28 April 1966 (C.E.S.). A total of 26 adults were reared from this host plant. Other collection dates are as follows: Hialeah, 9 May 1966 (C.E.S.). Hialeah, 6 June 1966 (C.E.S.). Adult emergence from the 28 April 1966 collection began 7 May and continued until 15 May 1966. The author noted a single flowerhead of Erigeron containing two pupal cases. T. actinobola seems to have a decided host preference for this species of Erigeron.

Solidago caesia L. Hialeah, Fla., 31 May 1966 (C.E.S.). Two adults were reared by the author from the seedheads. This is a new host record report for T. actinobola.

Wild Aster: Kansas City, Kans., 9 Aug. 1965 (C.E.S.). Two adults were swept from the flowers.

Discussion

The seed infesting tephritids are extremely easy to rear to the adult stages in Florida and elsewhere. The author has found through past experience that random plant samples, confined to clear glass rearing containers, often yield tephritid adults without first finding symptoms of infestations in the field. Many new host plant records are possible using this technique, not only for seed-feeding tephritids, but other insects such as agromyzids, seed feeding midges, and a wealth of micro-lepidopterous insects. The rearing from native Compositae is valuable since many plants of a non-economic value to man have not yet been evaluated as host plant reservoirs of economic plant pests.

The author collects wild or native composites from natural plant habitats for rearing purposes, desirably from areas exhibiting large stands of a single plant species. The composites are selected since the plant family seems to be favored as hosts for the non-economic Tephritidae. After the desired composite has been selected as a potential host plant, the author confines the seedhead portion to a rearing container covered with a fine mesh cloth and secured by a strong rubber band. The host, if unknown, must be determined by a specialist. A daily check in the morning and later in the evening will enable the observer to make an accurate record of adult emergence.

It is hoped that this discussion will be of some interest to entomologists engaged in this aspect of insect ecology. Florida, with its numerous ecological plant-niches and other environmental areas, will prove to be an interesting region for the study of the seed-infesting tephritids or other seed-feeding insects.
All Tephritidae cited in this paper, reared or collected by the author, were deposited in the U. S. National Museum Collections and/or in the Florida State Collection of Arthropods, Division of Plant Industry, Florida Department of Agriculture, Gainesville, Florida.

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LITERATURE CITED


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