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ASSOCIATED INSECTS REARED FROM GALLS OF *SAPERDA INORNATA* (COLEOPTERA: CERAMBYCIDAE) ON TREMBLING ASPEN IN MICHIGANDavid G. Grimble, Fred B. Knight and John C. Nord¹

The poplar gall *Saperda*, *Saperda inornata* Say, is a common pest of trembling aspen, *Populus tremuloides* Michx, in Michigan forests. Through its egg-laying activities and larval feeding, this insect causes wood defects and tree mortality (Graham *et al.*, 1963). While studying natural populations of this insect (Grimble and Knight, 1970), we collected many galls and found through rearing and dissection that they harbor a large and varied insect fauna.

LIFE HISTORY

S. inornata is a uniformly gray, pubescent beetle, about 8-13 mm long. Adults emerge from late May through June in northern Michigan and feed on aspen foliage before ovipositing. Eggs are deposited singly under the soft bark of aspen sucker stems or the small twigs of larger trees. Each egg is placed beneath a horseshoe-shaped egg niche grawed by the female. The female makes 1-5 egg-niches in a ring around the stem of a sucker or branch, the number usually increasing with stem diameter (Grimble *et al.*, 1969).

Eggs hatch in about 14 days and the larvae first bore horizontally around the stem in the outer xylem. Their feeding causes the growth of a spindle-shaped gall at that point (Fig. 1). Later, larvae bore into the gall, then upward or downward and parallel to the pith for a distance of about 1.5-3.8 cm (Fig. 2). The larvae maintain open frass-ejection ports, which also serve as entrance and exit points for parasites and associated insects. The life cycle takes either one or two years in northern Michigan, but mostly one year in southern Lower Michigan. One or two adults may emerge from each gall but most larvae die during the first few months following oviposition (Fig. 3).

Myers *et al.* (1968) found this insect most numerous in sparse aspen stands. High populations were found in slow-growing "off-site" sucker clones. Our experience indicated that the best gall collection sites were usually isolated clusters of aspen suckers along roadways or in brushy fields.

METHODS AND RESULTS

Active *S. inornata* galls were collected at many points throughout Houghton, Gogebic and Iron Counties, Michigan during May and August 1963-68. May collected galls were held in individual glass jars in the laboratory for approximately two weeks, while emerging insects were collected, then galls were dissected. August gall collections were dissected immediately.

Our largest collection consisted of 1167 galls taken from six selected aspen stands in May 1968. All were 1967 galls marked the previous August, so that when collected they were nearly one year old. The associated insect specimens recovered from this group (Table 1) illustrates the faunal variety usually found in our gall collections and the relative frequency of each species. Their relationships to *S. inornata*, insofar as known, are included. Many of them are expected to be inquilines or parasites of inquilinous species.

Table 2 is a list of additional and generally rarer species found in collections other than the May 1968 collection. No positive relationship between these insects and *S. inornata* was established; but inasmuch as the unidentified olethreuted larvae and the thrips were found in egg-niches soon after oviposition, they could be predators or

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Fig. 1. One-year-old *Saperda inornata* galls on trembling aspen twigs.

competitors of the young *S. inornata* larvae. Their rarity makes them interesting rather than significant in relationship to *S. inornata*.

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Fig. 2. A one-year-old gall split open to reveal two *Saperda inornata* larvae in adjacent galleries.



Fig. 3. A one-year-old gall split open to show a *Saperda inornata* pupa in its pupal cell.

Table 1. Associated insects reared from 1167 *S. inornata* galls in northern Michigan, May 1968.

| Order and Family | Species | Number Specimens | Relationship to <i>S. inornata</i> | |
|-----------------------------------|---|--|--|-----------------|
| Hymenoptera | | | | |
| Braconidae | <i>Meteorus cognatus</i> Muesebeck | 36 | Larval parasite | |
| | <i>Iphiaulax eurygaster</i> (Brulle) | 27 | Larval parasite | |
| | <i>Cenoceolius sanguineiventris</i> (Ashmead) | 18 | Larval parasite | |
| | <i>Bracon</i> n. spp. | 55 | Larval parasite | |
| | <i>Ascogaster</i> sp. | 4 | | |
| | <i>Atanycolus rugosiventris</i> (Ashmead) | 1 | | |
| | <i>Agathis cincta</i> (Cresson) | 2 | | |
| | Ichneumonidae | <i>Dolichomitus messor perlongus</i> (Cresson) | 20 | Larval parasite |
| | | <i>D. populneus</i> (Ratzeburg) | 8 | Larval parasite |
| | | <i>Xylophrurus bicolor</i> (Cushman) | 9 | Larval parasite |
| <i>Chasmias saucius</i> (Cresson) | | 5 | Parasitic on <i>P. tricincta</i> | |
| Eulophidae | <i>Euderus lividus</i> (Ashmead) | 19 | Larval parasite | |
| | <i>Tetrastichus</i> sp. | 2 | | |
| Perilampidae | <i>Perilampus similus</i> Crawford | 10 | Parasitic on <i>I. eurygaster</i> | |
| Platygasteridae | <i>Platygaster</i> sp. | 2 | | |
| Eurytomidae | <i>Eurytoma magdalidis</i> Ashmead | 3 | | |
| Pteromalidae | <i>Capellia</i> sp. | 7 | | |
| | <i>Habritys</i> sp. | 10 | | |
| | <i>Dibrachys cavus</i> (Walker) | 1 | | |
| | <i>Syntomopus</i> sp. | 1 | | |
| Encyrtidae | <i>Pseudencyrtus</i> sp. | 5 | | |
| | <i>Pseudorhopus</i> sp. | 24* | Prob. parasitic on <i>Megaselia</i> spp. | |
| | <i>Forcipestricis gazeaui</i> Burks | 11 | Prob. parasitic on <i>Forcipomyia</i> sp. | |
| Trichogrammatidae | <i>Ufens niger</i> (Ashmead) | 7 | | |
| Ceraphronidae | <i>Atritomellus</i> sp. | 1 | | |
| | <i>Telenomus</i> sp. | 2* | | |
| Diptera | | | | |
| Tachinidae | <i>Lixophaga</i> n. sp. | 200+ | Larval parasite | |
| Odiiniidae | <i>Odiinia</i> n. sp. near <i>xanthocera</i> | 200+ | Larval parasite | |
| Phoridae | <i>Megaselia</i> n. spp. | 90+ | Scavengers and/or facultative larval parasites | |
| Sciaridae | <i>Bradystia</i> sp. | 2 | | |
| Ceratopogonidae | <i>Forcipomyia</i> sp. | 4 | | |
| Lepidoptera | | | | |
| Aegeriidae | <i>Paranthrene tricincta</i> (Harris) | 7 | | |
| Coleoptera | | | | |
| Dermestidae | <i>Anthrenus scrophulariae</i> (L.) | 1 | | |

*All reared from one gall.

Table 2. Associated insects reared from *S. inornata* galls in northern Michigan.

| Order and Family | Species | Year | Number Specimens |
|---------------------|--|-------------------------------------|------------------|
| Hymenoptera | | | |
| Ichneumonidae | <i>Xylophrurus bicolor maurus</i> (Cushman) | 1967 | 1 |
| | <i>Townesia tenuiventris</i> Holmgren | 1967 | 1 |
| | <i>Trathala</i> sp. | 1967 | 1 |
| | <i>Homotrupus signatus</i> Gravenhorst | 1967 | 1 |
| | <i>Glypta</i> sp. | 1967 | 1 |
| | <i>Phaeogenes</i> sp. | 1967 | 9 |
| | <i>Stenomacrus</i> sp. | 1967 | 1 |
| | Braconidae | <i>Meteorus trachynotes</i> Viereck | 1967 |
| Sphecidae | <i>Crossocerus nigricornis</i> (Provancher) | 1963 | 1 |
| Lepidoptera | | | |
| Olethreutidae | Larvae of unknown species | 1963 | 4 |
| Thysanoptera | | | |
| Phalaeothripidae | <i>Lispthrips</i> sp. near or = <i>crassipes</i> (Jablonowski) | 1966 | 1 |
| | | 1967 | 2 |
| | <i>Acanthothrips nodicornis</i> (O. M. Reuter) | 1966 | 1 |