Agroforestry Systems **41**: 213–218, 1998.

Short communication

A pest on *Calliandra calothyrsus* in Cameroon

F. GAUHL[1,*], C. PASBERG-GAUHL[1] and G. GOERGEN[2]
[1] *Humid Forest Station, Yaounde, Cameroon;* [2] *Benin Research Station, Cotonou, Benin, of the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria (*Author for correspondence: Chiquita Brands International, P.O. Box 025216-1582, Miami, Florida 33102-5216, USA, E-mail: fgauhl@chiquita.com)*

Key words: Central Africa, Cerambycidae, Coleoptera, *Tragocephala*

Abstract. A beetle pest, *Tragocephala guerini* White (Col.: Cerambycidae) was observed damaging the branches of *Calliandra calothyrsus* Meissner in Cameroon, Central Africa. The pests biology and details of the damage on the host plant are described.

Introduction

Calliandra calothyrsus Meissner is a fast growing multi-purpose tree in the *Acacia* subfamily (Mimosoideae) of the legumes. Its origin is Central America. The plant is a multi-stemmed shrub with red flowers and grows four to six m in height (NAS, 1983). *C. calothyrsus* has been used in agroforestry since 1936 in Indonesia (NAS, 1983). More recently, it is widely used or tested in agroforestry systems throughout the tropics including Africa (Macqueen, 1992).

In areas where *C. calothyrsus* was introduced, it appeared for a long time to be free of any serious pest (NAS, 1983). From the Philippines, the cerambycid *Callimetopus* sp., the scarabaeid *Leucopholis irrorata* (Chevrolat) and two unidentified lymantriid moths have been reported as minor pests (Braza, 1991, 1993; Luego, 1989). In Kenya, low seed production of *C. calothyrsus* or complete lack of seeds is attributed to the rose flower beetle *Pachnoda ephippiata* Gerstaecker (Col.: Cetonidae) feeding on *C. calothyrsus* flowers (Kaudia, 1990). This paper reports the first observation of an insect pest attack on *C. calothyrsus* in Central Africa.

Observation, identification and nature of damage

In May 1996, during a survey on the pest and disease problems of *C. calothyrsus* in southern Cameroon, 16 farms were visited in three villages: Minkoameyos, Nkolfep and M'Balmayo, all located within a 60 km radius from Yaounde. Wilting of *C. calothyrsus* plants was found to be associated with rodents girdling the stem base partly or entirely, with fungal infection of the stembase, with insect larvae feeding in branches and with an unidentified disease, causing phytoplasma/virus-like symptoms.

On one farm in Nkolfep, an estimated 5% of the trees were infested by cerambycid larvae. Careful splitting of the infested branches revealed apod larvae, up to 60 mm long feeding in the hollowed center of the branches. The hollowed branches dried up, starting from the tip downward. This damage did only result in the death of infested branches. However, heavy insect infestation may also result in plant die back.

For further observation, infested branches were cut and kept at 25 ± 2 °C in plastic boxes with moistened paper tissue to avoid drying out of the 30–40 cm long branch pieces. After 37 days the first adults emerged.

The insects were identified (IITA identification report 20/96 by G. Goergen) as *Tragocephala guerini* White (Col.: Cerambycidae, Lamiinae: synonyms: *T. anselli pulchra* Jordani; *T. anselli buqueti* Thomson; *T. luciani* Thomson) (Lepesme and Villiers, 1944). According to a later revision of the Tragocephalini, this species belongs to the subspecies *senatoria* Chevrolat (Lepesme and Breuning, 1950).

The larvae of *T. guerini* are apod, elongate, and subcylindrical with the maximal width at the prothorax (Figure 1). They are pale testaceous with the cuticle unpigmented. The abdominal ampullae display three to four dorsal and two ventral transverse rows of subconical tubercles. The head capsule and the subapical part of the prothorax are ferruginous. On average the full-grown larvae measure 45 mm long and 7 mm maximum width at the prothorax. The adults are elongate, cylindrical, with a distinct tubercle at the prothorax and with the elytrae about two times as long as their basal width. Two testaceous

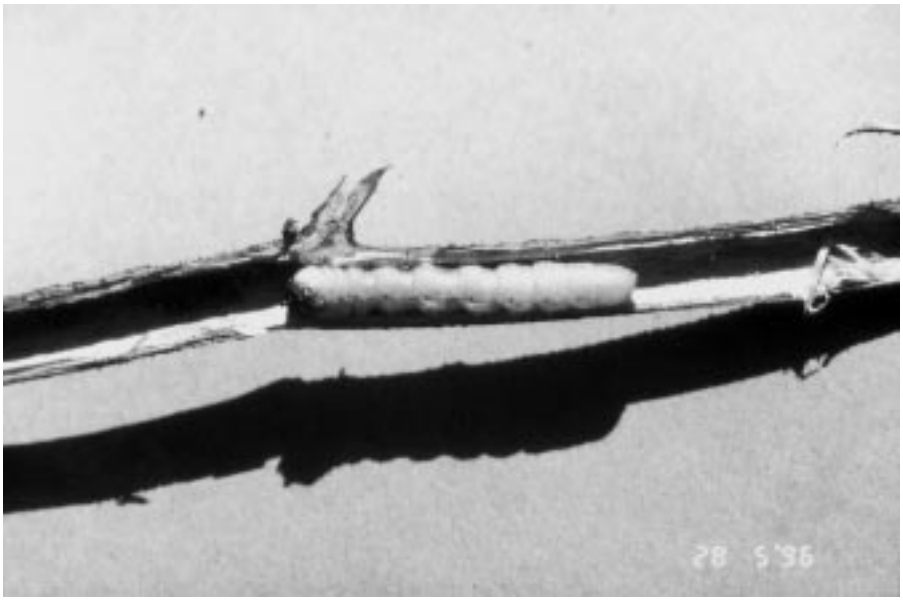

Figure 1. Tragocephala guerini (Col.: Cerambycidae) larva inside its tunnel in a branch of *Calliandra calothyrsus.*

lateral bands entirely cross the black metasternum. The black elytrae bear ferruginous pubescence in form of a notched band reaching the submedian suture. The pattern is altered apically by a series of three whitish spots of divergent size (Figures 4 and 5). They measure 16–30 mm long and 5–9.5 mm wide.

Oviposition takes place on branches of 0.6–2 cm in diameter. The larvae bore into and feed on branch wood, hollowing the center and leaving only the bark (Figure 1). In each attacked branch, only one larva was observed. At regular distances of 2–4 cm, they construct aeration holes through the bark (Figures 2 and 3). Galleries of up to 70 cm length were observed. Distal parts of branches were cut, the openings of the tunnels were closed with plugs of wood fibres (Figure 5). From the position of the plugs and the orientation of the fibres it was concluded that the larvae themselves concealed the openings.

Discussion and conclusions

The genus *Tragocephala* is widespread throughout West, Central and South Africa and Madagascar. Among the 28 species described from tropical Africa, 9 are endemic to West Africa (Lepesme and Breuning, 1950). The geographical distribution of *T. guerini* is recorded from Cameroon and Congo to eastern Africa (Entwistle, 1963). The biology of a closely related African species (*T. castnia* Thomson) is described in detail by Entwistle (1972). The *T. nobilis* group is known to be mainly associated with Cocoa occasionally causing serious damage of the tree. Other species of the genus were also recovered from *Citrus* spp., *Coffea* spp., *Gossypium* spp., *Cajanus cajan* and *Cinnamomum* spp. (Entwistle, 1963).

Calliandra calothyrsus is a recent introduction in the African agroforestry systems. Currently, the benefits of this leguminous tree under various residue management systems are being tested in farmers' fields (IITA, 1995). Despite its importance as planted fallow and in agroforestry systems, the plant pest and disease aspects have been largely neglected.

Although the insect damage observed on *C. calothyrsus* is limited to hollowing young branches, a systemic effect might occur as galleries are likely to serve as entry points for pathogens. In farmers' fields, it should be monitored whether *C. calothyrsus* plants are suffering further attack from other insect pests shifting from indigenous host plants. Similarly, *C. calothyrsus* plants may serve as a refuge for pests and natural enemies that attack the crops.

As a major component of an agricultural cropping system, pests and diseases of *C. calothyrsus* should receive the same attention as those of other crops. The establishment of a *C. calothyrsus* based agroforestry system is a long term investment for both farmer and researcher. If a major pest or disease problem leading to plant damage or death is introduced into the farmer's fields, the credibility of both the agroforestry system and the researcher/institute will

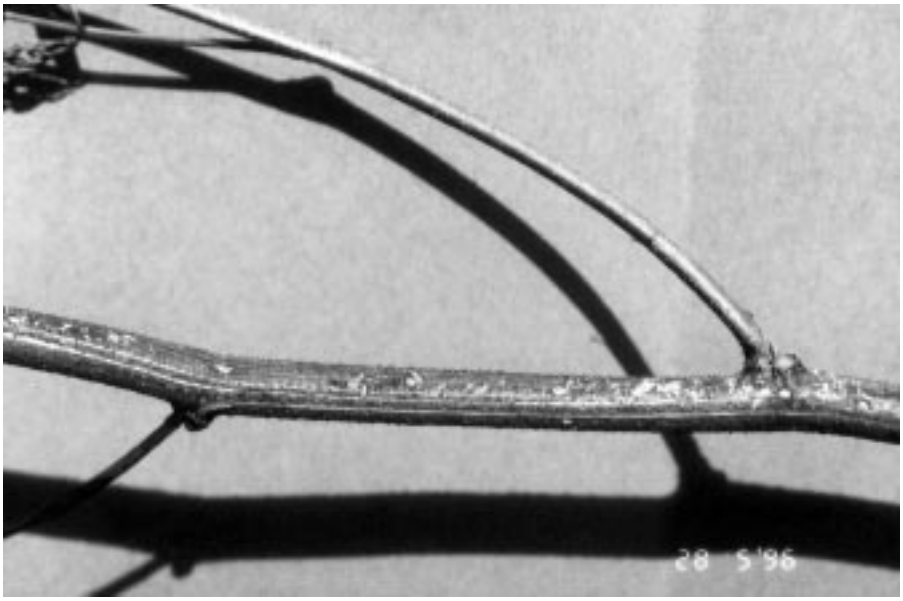

Figure 2. Fresh aeration holes in a hollowed *Calliandra calothyrsus* branch in Cameroon. The holes are filled with wood dust.

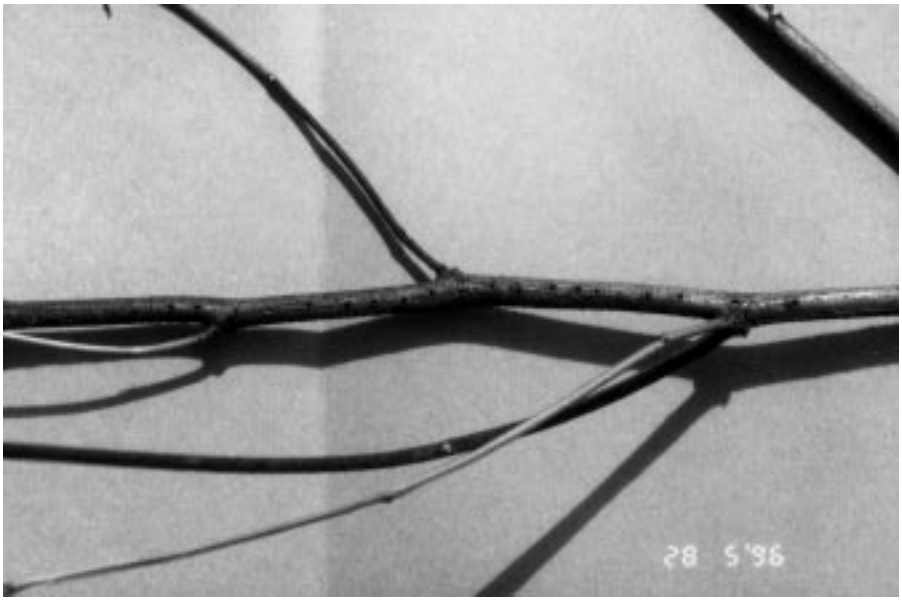

Figure 3. Older aeration holes in a hollowed *Calliandra calothyrsus* branch in Cameroon. The holes are free of wood dust. Two of the four twigs on the hollowed branch are still green and alive.

Figure 4. Adult beetle of *Tragocephala guerini* (Col.: Cerambycidae) in Cameroon, dorsal view.

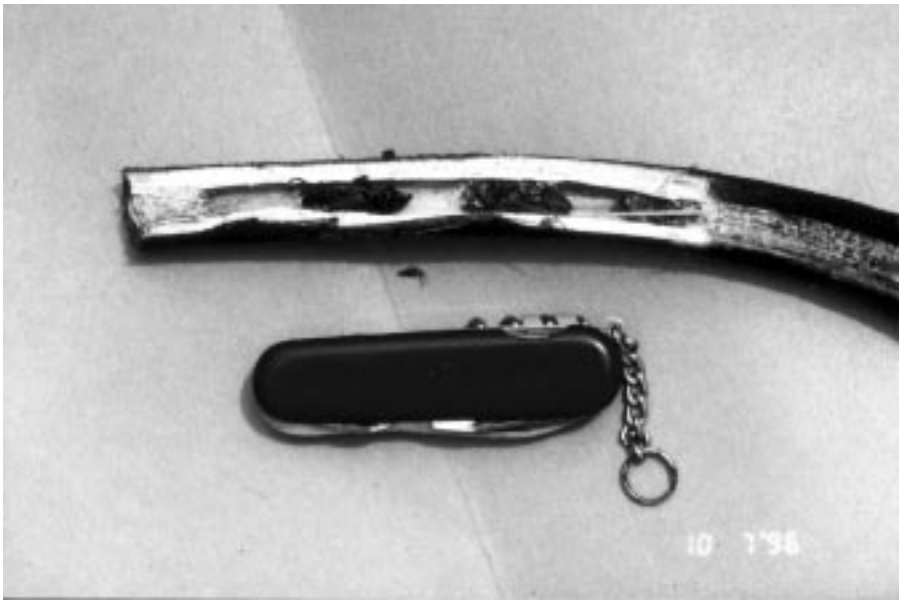

Figure 5. Cut end of a *Calliandra calothyrsus* branch with wood fibre plug, imago and exuvia of *Tragocephala guerini* (Col.: Cerambycidae) (the knife is 8.5 cm long, the diameter of the ring measures 1.2 cm) in Cameroon.

be irreversibly lost in the eyes of the farmer. The well documented problem with *Leucaena leucocephala* due to the psyllid pest *Heteropsylla cubana* observed in Southeast Asia and Pacific is a good lesson (Hughes, 1993), leading to the conclusion that health problems of *C. calothyrsus* could not be ignored, particularly when introduced in large areas.

References

Braza RD (1991) Insects damaging *Calliandra calothyrsus* in the Philippines. Nitrogen Fixing Tree Res Reports 9: 38–39

Braza RD (1993) A new beetle pest of *Calliandra calothyrsus* in the Philippines. Nitrogen Fixing Tree Res Reports 11: 71–72

Entwistle PF (1963) The identity, variation and distribution of some members of the genus *Tragocephala Castelnau* (*Coleoptera: Lamiinae*) in West Africa, with descriptions of five new sub-species. Trans R Ent Soc Lond 115(3): 63–93

Entwistle PF (1972) Pests of cocoa. Longman, London, UK, 779 pp

Hughes CE (1993) *Leucaena* genetic resources. The OFI Leucaena seed collections and a synopsis of species characteristics. Oxford Forestry Institute, Oxford, UK, 117 pp

IITA (1995) Annual report 1995. International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria, 55 pp

Kaudia A (1990) Report of an insect pest on *Calliandra calothyrsus* (Meissn.) in Kenya. Nitrogen Fixing Tree Res Reports 8: 126

Lepesme P and Breuning S (1950) Les tragocephalini de l'ouest africain. Longicornea I: 423–506

Lepesme P and Villiers A (1944) Les longicornes du cafeier en Afrique intertropicale. Imprimerie Nationale, Paris, France, 44 pp

Luego JN (1989) *Calliandra* stemborer infestation at a seed orchard in Cebu, Philippines. Nitrogen Fixing Tree Res Reports 7: 76

Macqueen DJ (1992) *Calliandra calothyrsus*: Implications of plant taxonomy, ecology and biology for seed collection. Commonwealth Forestry Review 71(a): 20–34

National Academy of Sciences (NAS) (1983) *Calliandra*: a versatile small tree for the humid tropics. National Academy Press, Washington DC, USA