Two new species of Trichogramma (Hymenoptera; Trichogrammatidae) from Malawi; egg parasitoids of Diopsis macrophthalma Dalman (Diptera; Diopsidae)

by

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ABSTRACT. — Two new species of *Trichogramma* belonging to the *minutum* group are described from Malawi (Central Africa), viz *Trichogramma kalkae* and *Trichogramma pinneyi*. Both species together were found to parasitize up to 90% of the eggs of *Diopsis macrophthalma* Dalman present in the rice fields of southern Malawi. Alternative hosts are eggs of *D. apicalis* Dalman and *Sepedon angularis* Adams (Diptera Sciomyzidae). *T. kalkae* has also been found in rice fields in Togo (West Africa).

INTRODUCTION

During an extensive study by the second author (Feijen, 1975, 1977) on the biology, population dynamics and economic importance of *D. macrophthalma* Dalman (=*D. longicornis* Macquart = *D. thoracica* Westwood — new synonyms — Feijen, in prep.) which is considered to be an important rice pest in Africa, two undescribed *Trichogramma* species were found. They belong to the *minutum* group (cf. Nagarkatti & Nagaraja 1977).

Parasitation could be as high as 90% of the *Diopsis* eggs present in the field. Data on the biology will be presented at a later date. (Feijen and Schulten, in prep.)

The terminology used in describing the genitalia follows Nagarkatti & Nagaraja, 1971.

The two new species have been named after Dr. Margaret Kalk and Dr. T. C. Pinney, formerly professors in resp. Biology and Agriculture at the University of Malawi.

Trichogramma kalkae sp.n.

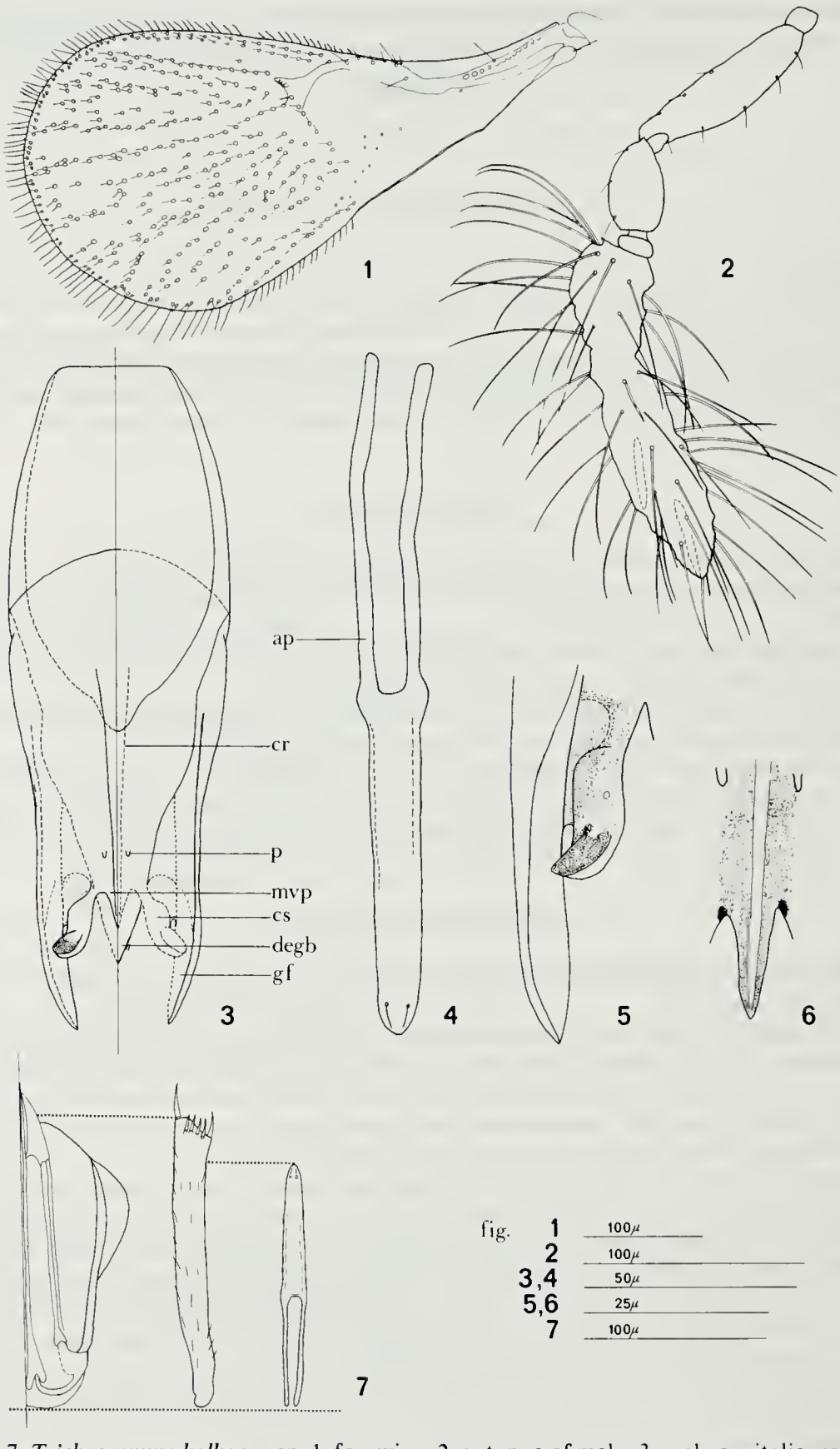
Adults small, 0.53-0.75 mm long and 0.13-0.15 mm wide across the head depending on number of progeny per *Diopsis* egg.

Male: Reared from eggs of *D. macrophthalma* at 25°C and 70% R.H. with yellowish brown legs and antennae but head, pronotum, mesoscutum, mesopleurae, abdomen, hind femara and coxae dark brown to blackish. Longest of marginal setae of forewing about one-seventh width of wing (fig. 1). Antennal flagellum unsegmented with rather short hairs, the longest of which is somewhat longer than twice the maximum width of flagellum (fig. 2).

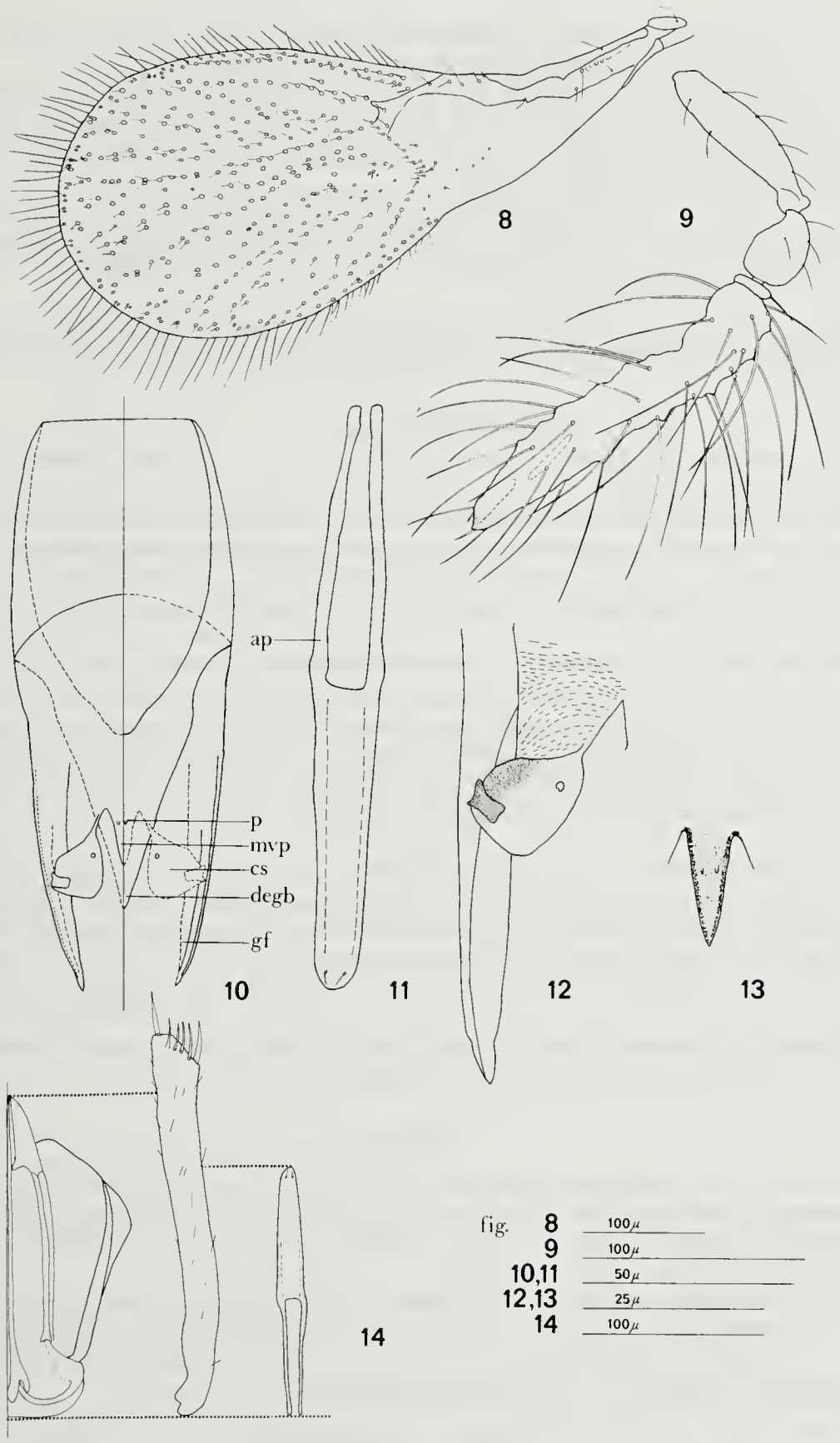
Genitalia (figs. 3-6). The dorsal expansion of gonobase is more or less triangular with tapering apex which extends to level of chelate structures (fig. 3). Aedeagus (fig. 4) slightly longer than apodemes, both together clearly shorter than hind tibia. Large chelate structures (fig. 5) located far below level of gonoforceps. Small but conspicuous protuberances at base of chelate structures (distance between protuberances and base varies somewhat between specimens). Median ventral projection (fig. 6) very distinct and long with two chitinous ridges extending anteriorly to about one-third of entire length of genitalia.

Female: Pigmentation and wing trichation same as in male. Ovipositor somewhat longer than hind tibia (fig. 7).

Distribution. This species has been collected in the rice fields of the Lower Shire Valley and the Lake Chilwa area. It was also found in experimental plots in Limbe and probably it occurs also in the rice fields in the Central and Northern Region where *D. macrophthalma* is very common. The first author also bred this species from *D. macrophthalma* eggs, collected in rice fields at Mission Tové, Togo (April 1976).



Figs. 1-7. *Trichogramma kalkae* n. sp. 1, forewing, 2, antenna of male, 3, male genitalia. cs-chelate structure; cr-chitinous ridge; degb-dorsal expansion of gonobase; gf-gonoforceps; mvp-median ventral projection; p-protuberance. 4 aedeagus, ap-apodeme, 5, enlarged view of chelate structure, 6, enlarged view of median ventral projection, 7, relative lengths of aedeagus, hind tibia and ovipositor.



Figs. 8-14. *Trichogramma pinneyi* n. sp. 8, forewing, 9, antenna of male, 10, male genitalia: cs-chelate structure; degb-dorsal expansion of gonobase; g-gonoforceps; mvp-median ventral projection; p-protuberance; 11, aedeagus, ap-apodeme, 12, enlarged view of chelate structure, 13, enlarged view of median ventral projection, 14, relative lengths of aedeagus, hind tibia and ovipositor.

Alternative hosts are *D. apicalis* Dalman (= *D. tenuipes* Westwood), *Sepedon angularis* Adams (Diptera, Sciomyzidae), and unidentified eggs of probably a fly species.

Holotype. Male from Likangala rice scheme, Lake Chilwa, Malawi, ex egg of *D. macrophthalma* on rice, March 1975, at the Institute of Taxonomic Zoology (Zoologisch Museum), Entomology Department, University of Amsterdam, The Netherlands. Male and dissected male genitalia mounted on slide.

Fifteen slides each with ca. 10 paratypes from the same area. Paratypes in Agricultural Research Station, Bvumbwe, Malawi; Muséu de História Natural, Maputo, Moçambique; Commonwealth Institute of Biological Control, Bangalore, India; Istituto di Entomologia Agraria "F. Silvestri", Portici, Italy.

Remarks. This species resembles *T. californicum* Nagaraja & Nagarkatti, 1973, but differs by its dark pigmentation, the smaller number of hairs on the flagellum and by the different chelate structures.

Trichogramma pinneyi sp.n.

Adults small (0.75—0.84 mm long and 0.15—0.17 mm wide across head depending on number of progeny per *Diopsis* egg).

Male: Reared at 25°C and 70% R.H. with light brown legs and antennae, but head, pronotum, mesoscutum, mesopleurae, abdomen, tibiae and hind coxae dark brown to blackish. Longest marginal setae of forewing about one fifth width of wing (fig. 8). Antennal flagellum unsegmented with long hairs, the longest of which is nearly three times maximum width of flagellum (fig. 9).

Genitalia (figs. 10-13). The dorsal expansion of gonobase is more or less triangular with tapering apex which extends to level of chelate structures (fig. 10). Aedeagus (fig. 11) somewhat longer than apodemes, both together about two-thirds of length of hind tibia. Large chelate structures located far below level of gonoforceps (fig. 12). Small protuberances above base of median ventral projection (fig. 13).

Female: Pigmentation and wing trichation same as male. Ovipositor clearly shorter than hind tibia (fig. 14).

Distribution and alternative hosts. Same as previous species but unknown outside Malawi.

Holotype. Male from Likangala rice scheme, Lake Chilwa, Malawi, ex egg of *D. macrophthalma* on rice, March 1975 at same Museum as previous species. Male and dissected male genitalia mounted on slide. Allotype female on slide.

Fifteen slides each with 4-20+ paratypes from the same area. Paratypes at institutions mentioned earlier.

Remarks. This species can easily be recognised by its peculiar chelate structures which as yet have not been found in any other *Trichogramma* species.

DISCUSSION

Descamps (1957) reported that *Xanthoatomus ethiopicus* Risbec, 1956, parasitized up to 75% of the eggs of *D. macrophthalma* in Cameroon. This species which was originally described as a parasitoid of *Proceras africanum* Aurivillius (Lepidoptera; Pyralidae) was renamed by Viggiani (1969) as *Trichogramma ethiopicum* (Risbec).

As *T. ethiopicum* has not yet been re-recorded as a parasitoid of *D. macrophthalma* in West Africa (cf. Nagarkatti & Nagaraja, 1977) possibly *T. ethiopicum* has been confused with one or both of the species described here. The fact that *T. kalkae* was found as a parasitoid of *D. macrophthalma* in Togo and not *T. ethiopicum* also points in this direction.

ACKNOWLEDGEMENTS

Dr. Sudha Nagarkatti and Dr. G. Viggiani are thanked for their interest shown in the identification of the specimens.

The research of the second author received financial support from WOTRO (Netherlands Foundation for the Advancement of Tropical Research).

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WIGGLESWORTH, SIR VINCENT B., 1976, INSECTS AND THE LIFE OF MAN. Collected essays on pure science and applied biology: 1—217, 9 figs. index 5 kolommen. Chapman & Hall Ltd., London. ISBN 0-412-14730-0; prijs (paperback) £ 3.25. (een gebonden editie, ISBN nummer 0-412-14700-9 kost £ 6.00).

In dit boekje staan, in nagenoeg ongewijzigde vorm, hooguit hier en daar met een voetnoot of naschrift aangevuld, de teksten van een 16 causerieën, radiopraatjes, presidential addresses, enz. die Wigglesworth in de loop van zijn productieve leven heeft geschreven. Alle teksten waren bedoeld voor een aandachtig, maar niet specifiek deskundig publiek. Sommige geven een historisch overzicht (vijftig jaren insektenphysiologie), andere belichten een historische figuur van entomologische importantie (Sir John Lubbock), of een in algemene termen gesteld probleem uit de — veelal natuurlijk toegepaste — entomologie. Fascinerend door zijn vooruitziende bezorgdheid is bijvoorbeeld het in 1945 geschreven essay „DDT en het natuurlijk evenwicht". Natuurlijk zijn er ook twee hoofdstukjes over de epidermis-cel en over preformatie en ontwikkeling, twee onderzoekthema's waarmee de auteur bijzonder grote verdiensten heeft verworven.

De hoofdtitel van het boekje kan op een paar manieren worden gelezen. Ze zijn alle toepasselijk, maar ik zie het meest in „insekten en het leven van de mens Wigglesworth". Want wat het boekje zo buitengewoon aantrekkelijk leesbaar maakt is de wijze waarop deze bundel essays een beeld oproept van de persoonlijkheid van de auteur — erudiet, wijs, geniaal bioloog en voortreffelijk schrijver. Insects and the life of man is een ongewoon aardig boek, bovendien voor een prijs te koop waarvoor wij in Nederland onze hand niet omdraaien. — W. N. Ellis.

RUPS VAN SPHINX LIGUSTRI (LINNAEUS) OP FORSYTHIA (LEP., SPHINGIDAE). Door bemiddeling van de redactie van „Natura" ontving ik een tekening van een Sphingidenrups, die 14 september 1977 door Dr. E. L. Krugers Dagneaux te Santpoort op Chinees klokje gevonden was. De uitstekende tekening was onmiddellijk te herkennen als die van de rups van de Ligusterpijlstaart. De voedselplant is niet zo vreemd, als we bedenken dat deze bekende heester tot de Oleaceae behoort, net als de Liguster en de Sering, waarop de rups toch wel het meest aangetroffen wordt. — B. J. Lempke.