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# A new species of *Trichogramma* Westwood (Hymenoptera: Trichogrammatidae) closely related to *T. chilonis* Ishii from Pakistan

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## Abstract

A new species of *Trichogramma* Westwood (1833) (Hymenoptera: Trichogrammatidae) parasitizing eggs of *Helicoverpa armigera* (Hübner, 1808) (Lepidoptera: Noctuidae) on tomato in Northern Punjab, Murree hills, Pakistan is described. The new species is closely related to *T. chilonis* Ishii, the most widely distributed species in Pakistan and India. Morphological characters, ITS-2 sequence differences and reproductive data are presented to distinguish *T. siddiqi* **n. sp.** from *T. chilonis*.

**Key words:** Chalcidoidea, egg parasitoid, taxonomy, new species, ITS-2

## Introduction

The 0.3–0.5 mm small body size and lack of specific morphological characters have made taxonomic studies of egg parasitoids in the genus *Trichogramma* Westwood (1833) (Hymenoptera: Trichogrammatidae) difficult (Pinto 1999). *Trichogramma* species show considerable intraspecific variability depending on host species and abiotic conditions during development (e.g. Salt 1937; Pinto *et al*. 1989) and species determinations have relied mostly on subtle differences in male genitalia. The existence of sibling species in the genus has rendered accurate identification even more difficult (Nagaraja 1973; Pintureau 1997). The latter problem has been addressed by crossing experiments to check for reproductive isolation between different strains (e.g. Pintureau 1991; Pinto *et al*. 1991). More recently, molecular characters have been introduced into the taxonomy of *Trichogramma* (Stouthamer *et al*. 1999; Silva *et al*. 1999), which not only provide additional data for taxonomy but also enable identification of female specimens. One main reason for the interest in the taxonomy of *Trichogramma* is the worldwide need of these parasitoids for biological control of pests of Lepidoptera (Li 1994).

A survey of the distribution of species of *Trichogramma* was performed in different ecological zones of Pakistan in the years 2002–2004 and *T. chilonis* Ishii was found to be most abundant (Nasir 2005). In this study we studied in detail the strains of *T. chilonis* and discovered among them a new species in Punjab. This new species is described below and differentiated from *T. chilonis* with the help of external and internal morphological characters, crossing experiments and molecular data.

## Materials and methods

**Slide preparation, use of terminology and type specimens.** The species description follows the terminology, morphological measurements and ratios used by Pinto (1999). Abbreviations used in the description are: AD: Apical distance; AL: Aedeagus length; AW: Apical width; BD: Basal distance; DA: Dorsal aperture; DAL: Dorsal

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