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## Phytoseiid mites of the tribe Typhlodromini (Acari: Phytoseiidae) from sub-Saharan Africa

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## Abstract

This is the ninth publication in a series on the taxonomy of phytoseiid mites of sub-Saharan Africa. Sixty-five phytoseiid species of the tribe Typhlodromini Wainstein, all of which are in the genus *Typhlodromus* Scheuten are reported in this paper (62 in the subgenus *Anthoseius* DeLeon and 3 in the subgenus *Typhlodromus* Scheuten). They refer to all species of this tribe known to occur in sub-Saharan Africa. Fifteen new species are described and 41 species are redescribed. Most of the reported species were collected in various habitats in southern Africa and in cassava habitats in tropical Africa. A key is included for the separation of these species.

**Key words:** Biological control, predator, Phytoseiidae, cassava, taxonomy, *Typhlodromus*

## Introduction

This paper is the ninth in a series dealing with the determination of sub-Saharan African phytoseiid mites. The first six papers dealt with species of the Amblyseiinae (Moraes *et al.* 2001b; Moraes *et al.* 2006; Moraes *et al.* 2007a, 2007b; Zannou *et al.* 2006, 2007), the seventh with species of the Phytoseiinae (Ueckermann *et al.* 2007), and the eighth with species of the Paraseiulini (Moraes *et al.* 2008).

The whole series, including the present paper, refers to all species currently reported from sub-Saharan Africa, with information on morphological variation of the species that have been recollected in surveys conducted in South Africa by South African professionals and in other countries by personnel of the International Institute of Tropical Agriculture. In the latter case, surveys were conducted within the scope of an extensive project for the biological control of the cassava green mite [*Mononychellus tanajoa* (Bondar)] in Africa (Yaninek 1988; Yaninek & Herren 1988; Yaninek & Hanna 2003). The main objective of those surveys was to evaluate the composition of the phytoseiid fauna in cassava fields and on the surrounding vegetation, before and after the introduction of exotic phytoseiids from the Neotropics for control of the pest. The objective of the present paper is to report on the phytoseiid mites of the tribe Typhlodromini Wainstein, known from sub-Saharan Africa with redescriptions of known species and descriptions of new species based on specimens found in this study. A key is provided to allow the identification of all the species of this tribe known from sub-Saharan Africa.

Species in this present study found in association with web producing spider mites are: *T. (A.) hartlandrowei* (Evans) (*Tetranychus neocaledonicus* André), *T. (A.) johannae* Ueckermann & Loots (Tetranychidae), *T. (A.) saevus* Van der Merwe (amongst others *Mononychelus lippiae* Meyer), *T. (A.) ndibu* Pritchard & Baker (*T. neocaledonicus*, *Tetranychus* sp and *Eutetranychus* sp.), *T. (A.) paganus* Van der Merwe (amongst others *T. gardeniae* Meyer), *T. (A.) praeacutus* Van der Merwe [amongst others *Eutetranychus orientalis* (Klein)] and *T. (A.) persianus* McMurtry [was reared on *T. pacificus* (McGregor)].

Setal nomenclature is that of Rowell *et al.* (1978) and Chant & Yoshida-Shaul (1991) for dorsal and ventral surfaces of the idiosoma, respectively. Idiosomal setal patterns used here are those of Chant & Yoshida-Shaul (1992). All measurements are given in micrometres; each measurement corresponds to the average for the number of individuals indicated for each sex of each species followed (in parentheses) by the respective ranges (if measurement is variable). For some of the redescribed species, measurements of type specimens are provided; in those cases, if measurements of specimens collected in this study are also provided, then the measurements of the types are shown in square brackets. Dorsal shield width was always taken at the widest level of the proscutum, and the ventrianal shield width at level of anus was always taken at the middle part of the anus. Macrosetae for which measurements are not provided should be considered as absent. Abbreviations used for depositories of type specimens are: ESALQ-USP (Escola Superior de Agricultura “Luiz de Queiroz”, Universidade de São Paulo, Piracicaba-SP, Brazil); IITAIM (International Institute of Tropical Agriculture Insect Museum, Cotonou, Republic of Benin) and NCA-PPRI (National Collection of Arachnida, PPRI, Pre-