

# Sensillary patterns in *Vertagopus* with description of a new European species (Collembola, Isotomidae)

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*Sensillary patterns in Vertagopus with description of a new European species (Collembola, Isotomidae)*— The species *Vertagopus haagvari* n. sp. is described from corticole habitats in Norway, Finland, Denmark and Poland. It differs from the common *Vertagopus cinereus* (Nicolet) in sensillary chaetotaxy of the tergites. Two patterns of sensillary chaetotaxy were found in 13 examined species of the genus. A third pattern was observed in an undescribed species from Pennsylvania, USA.

Key words: *Vertagopus haagvari* n. sp., Collembola, Sensillary chaetotaxy, Europe.

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## Introduction

There are 22 described species of the genus *Vertagopus*, and work in progress indicates that many species are still unnamed. In addition several of the known species are poorly defined and in need of revision. Since the introduction of a consistent system of sensillary chaetotaxy by DEHARVENG (1979), the detailed patterns of sensilla on the tergites have become

one of the most powerful taxonomic tools in various groups of Collembola, in particular in the family Isotomidae (ПОТАПОВ 1989, 1991; FJELLBERG 1993).

For some time we have been aware of a particular «form» of the common *Vertagopus cinereus*, differing in colour and general appearance. It was not until the sensillary chaetotaxy was studied, that it became apparent that two different species were involved. Survey of a larger

number of species proved that two main sensillary patterns are generally established and offer useful diagnostic characters.

The number of sensilla on the tergites does not change during ontogeny of the individual, and the patterns are most easily observed in small juveniles with a sparse hair cover.

## Results

### The *arboreus* group

*Vertagopus arboreus* (Linnaeus, 1758)

*Vertagopus cinereus* (Nicolet, 1841)

*Vertagopus reuteri* (Schött, 1902)

*Vertagopus pseudocinereus* Fjellberg, 1975

*Vertagopus* cf. *monta* (Christiansen & Bellinger, 1980)

The number of macrosensilla on each half of the tergites of th.2-abd.5 correspond to the formula 55/44456 (fig. 1B). In addition there is one spine-like microsensillum (ms) on th.2 and one between the two most lateral macrosensilla on abd.3. A slight individual variation is seen in the number of sensilla on abd.4, varying from five to seven. Other tergites appear constant.

### The *westerlundi* group

*Vertagopus westerlundi* (Reuter, 1897)

*Vertagopus brevicaudus* (Carpenter, 1900)

*Vertagopus sarekensis* (Wahlgren, 1906)

*Vertagopus arcticus* Martynova, 1969

*Vertagopus pallidus* Martynova, 1974

*Vertagopus* sp. 1 (Canada: Resolute Bay)

*Vertagopus* sp. 2 (Alaska: Brooks Range)

*Vertagopus haagvari* n. sp.

Species of this group have a macrosensillar formula as 44/33346 (fig. 1A). Microsensilla as in previous group. Abd.4 sometimes has five sensilla (individual variation, perhaps constantly five in some species). The above spe-

cies all have an arctic, alpine or generally northern distribution.

The differences between the groups are most easily observed on abd.1-2 that has either three or four sensilla on each side. The *westerlundi* group has only one sensillum between the two lateral macrochaetae, while the *arboreus* group has two.

Individuals in a sample of an undescribed *Vertagopus* from Pennsylvania (White Haven, Pocono Mts.) have a sensillary formula as 66/55556, and the microsensillum on abd.3 is moved forward, away from the p-row (fig. 1K). This indicates that more than two main patterns will be found in the genus.

*Vertagopus haagvari* n. sp. (figs. 1A, C-J)

Type material (all A. Fjellberg leg., mounted in slides).

Holotype: Reproductive male from «Norway, VAY: Kristiansand. Grovann Naturreservat, 24.IV.1994. U. bark, rotten wood. 94.194», deposited at Tromsø Museum, Dept. of Zoology, Norway.

Paratypes: one juv., one female and two males from «Denmark, Fyn: Fiskerup Skov, 24.III.1994, U. bark, *Fagus*. 94.079»; one female, ditto, except sample 94.077; one female, ditto, except sample 94.078; one male, ditto, except sample 94.076; two males from «Poland, Bialowieza, 10.IX.1994»; one female from «Norway, Bø: Modum, Haugfoss, 26.VI.1994, Spruce forest, 94.250»; one male from «Finland, Ab: S of Parainen, 1km S Granvik-cross, 27.IX.1995, U. bark, dead oak, 95.352»; two males, one female, one juv. from «Finland, Ta: Tyry, S. Jyväskylä, 28.IX.1995, Alder/birch bark, 95.365»; six specimens from «Finland, Tb: Pyhä-Häkki Nat. Park, 1.X.1995, moss on fallen pine, 95.380». All the above paratypes deposited together with holotype. In addition a slide with two males and one female from «Norway, VE: Borre, Borrevann NW, 14.V.1995, Rotten Alnus bark, 95.153», is depos-

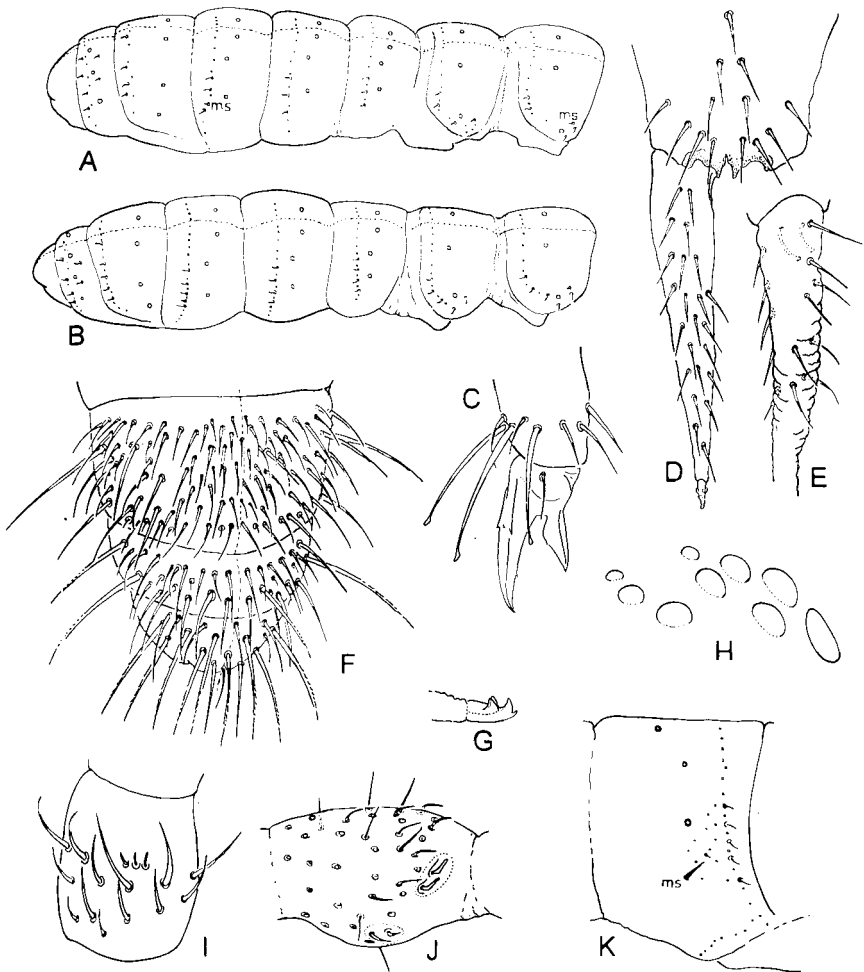


Fig. 1. Position of sensilla and microsensilla (ms) on th.2-abd.5 in relation to macrochaetae and ordinary setae of the p-row: A. *Vertagopus haagvari* n. sp.; B. *Vertagopus cinereus*. *Vertagopus haagvari* n. sp.: C. Claw and distal part of tibiotarsus; D. Dens and manubrium, ventral; E. Basal part of dens, lateral; F. Abd.4-6; G. Mucron; H. Postantennal organ and ocelli; I. Dorsal side of right antennal segment 1, male; J. Antennal segment 3 with curved and erect sensilla, male. K. *Vertagopus* sp. from Pennsylvania, left side of abd.3 with sensilla and microsensillum (ms).

Posición de las sensilas y microsensilas (ms) en tó.2-abd.5 en relación con las macrosedas y sedas ordinarias de la fila posterior (p): A. *Vertagopus haagvari* sp. n.; B. *Vertagopus cinereus*. *Vertagopus haagvari* sp. n.: C. Uña y parte distal del tibiotarso; D. Dens y manubrio, vista ventral; E. Parte basal del dens, vista lateral; F. Abd.4-6; G. Mucron; H. Órgano postantenal y ocelos; I. Cara dorsal del artejo antenal derecho 1, macho; J. Artejo antenal 3 con sensilas curvadas y erectas, macho. K. *Vertagopus* sp. de Pensilvania, lado izquierdo y abd.3 con sensilas y microsensilas (ms).

ited at the Natural History Museum, Dept. of Entomology, London.

#### Description

Size up to 1.1 mm. Colour violet blue with paler spots. Abd.1-3 with posterior edges narrowly darkened. Abd.5-6 darker than rest of body. Furca shorter than antenna. Ocelli 8+8, two smaller than others. PAO about 1.5 as long as nearest ocellus (fig. 1H). Labrum with 4/554 setae and 4 high, roundish papilla at apex. Maxillary palp bifurcate, sublobal hairs 4. Maxilla and mandibles unmodified. Ant.1 with a ventral group of 5-7 curved hair-like sensilla. Males with a group of 1-4 dorsolateral sensilla (fig. 1I), absent in females. Ant.2 with up to five curved sensilla on dorsal side, and up to six erect sensilla on ventral side. Ant.3 with up to eight curved sensilla on dorsal side and up to ten erect sensilla on both dorsal and ventral sides. Number of sensilla on ant.2-3 increase with size of the individual. Both types of sensilla (erect and curved) are present in males and females (fig. 1J). Ant. 3 organ normal, with two curved dorso-lateral sensilla and two ventrolateral sensilla (one spine-like, one hair-like). Ant.4 with numerous curved and erect sensilla. Subapical pin-setae long, subequal. Apex with two blunt lobes. Tergites with 44/33346 macrosensilla and 10/00100 microsensilla (fig. 1A). Last three abdominal segments with long, curved macrochaetae that are clearly serrated (fig. 1F). Median macrochaetae on abd.6 are 2.8-3.1 as long as inner edge of last claw. Manubrium with 12-15 ventral setae (fig. 1D). Dens usually with eight dorsal setae (fig. 1E). Mucro almost symmetric, with small apical tooth and subequal basal teeth at same level (fig. 1G). Retinaculum with 4+4 teeth and 5-7 setae. Abd.2 with a ventromedian group of 5-11 setae. Ventral tube with 4-5 distal setae on each side and 5-7 posterior setae. Anterior setae absent. Th.3 with 3-6 setae on each side of ventral line. Head with 5-8 setae on each side along ventral line. Claws

weakly curved, with distinct lateral and inner teeth. Tenent hairs clearly clavate (fig. 1C).

#### Discussion

The new species is very similar to *cinereus*, notably by presence of ventral setae on th.3 and abd.2. It differs by smaller size, less cylindrical body shape, longer and more strongly serrated setae on tip of abdomen and colour that is more bluish than the grayish-brown *cinereus*. Differences in colour and hair cover will normally distinguish the two species in mixed samples. Different sensillary formulas are decisive characteristics (see *arboreus* group and *westerlundi* group).

The particular male sensilla dorsolaterally on ant.1 (fig. 1I) are seen in none of the other examined *Vertagopus*. The erect sensilla on ant.2-3 is also normally a male character. In females they are only seen in *haagvari* and the sp.1 from Resolute Bay.

#### Distribution and ecology

Under bark on dead trees, both conifers and hardwood, often in association with *cinereus*. Sometimes also in forest litter. So far seen from Poland, Denmark, Finland and Norway (for details, see type material above).

#### Resumen

*Quetotaxia de Vertagopus con descripción de una especie nueva europea (Collembola, Isotomidae)*

Se describe la especie *Vertagopus haagvari* sp. n. de las áreas costeras de Noruega, Finlandia, Dinamarca y Polonia (fig.1). Se diferencia de *Vertagopus cinereus* (Nicolet) por la quetotaxia sensilar de los terguitos.

En las 13 especies estudiadas de este género se han encontrado dos tipos de quetotaxia sensilar. Se ha observado un

tercer tipo de quetotaxia en una especie no descrita de Pennsylvania, E.U.A.

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