

Scanning electron micrographs of medically important dust mite, *Suidasia pontifica* (Acari: Astigmata: Saprogllyphidae) in Malaysia

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Abstract. Scanning electron microscope (SEM) images of dust mites, *Suidasia pontifica*, is presented to provide an improved visualization of the taxonomic characters of these mites. *Suidasia pontifica* can easily be identified by its scale-like cuticle, presence of external vertical setae (*ve*), longer external scapular setae (*sce*) compared to internal scapular setae (*sci*) and 3 ventral spines on apex of tarsus I. The differences in morphology of male and female *S. pontifica* are also discussed.

INTRODUCTION

Suidasia pontifica Oudemans, 1905 is a mite that is cosmopolitan in distribution (Chmielewski, 2009). In Malaysia, the species was found as a common inhabitant of house dust (Ho & Nadchatram, 1984; Ho & Nadchatram, 1985; Ho & Mariana, 1994; Mariana *et al.*, 2000; Mariana, 2002). Eighty percent (80%) of the houses surveyed were positive for this mite with densities ranging from 2 to 50 mites per gram of dust (Mariana, 2002). The species was also found in commercial goods such as milk powder (Ho, 1996), rice grains (Mariana *et al.*, 2009) and rice flour (Mariana *et al.*, 2010). In the past, the species was suspected to be involved in dust sensitivity (Pearson & Cunningham, 1973), but it has now been shown to produce allergens and is as important as other allergen producing mite in sensitization and causing allergic symptoms in Malaysians (Mariana *et al.*, 2002).

The species *S. pontifica* was first described in 1905 by Oudemans. This however, was being later redescribed as *Suidasia medanensis* Oudemans, 1923

(Oudemans, 1924). Notes on the species were then used in the description of mites of stored food and houses (Hughes, 1976) and a new species of *Suidasia* from Australia (Fain & Philips, 1978). Little information is available on the biology of *S. pontifica* (Mariana *et al.*, 1998; Chmielewski, 2009). Illustration of *S. pontifica* by scanning electron micrographs (SEM) has not been widely reported. SEMs of the species are presented here to provide an improved visualization of the morphological characters of the mites.

General morphology

Suidasia pontifica is a minute mite with its dorsal, lateral and some parts of the ventral cuticle finely wrinkled or covered with scale-like verrucae (Figure 1). Dorsally, the verrucae are bigger and rounded in shape and becoming more elongate towards lateral side of the body (Figure 2). Ventral verrucae are also present but are less distinct and bigger at some parts of opisthosoma (Figure 3). A propodosomal shield is present in the anterior median part of the idiosoma. The shield has a straight posterior margin and

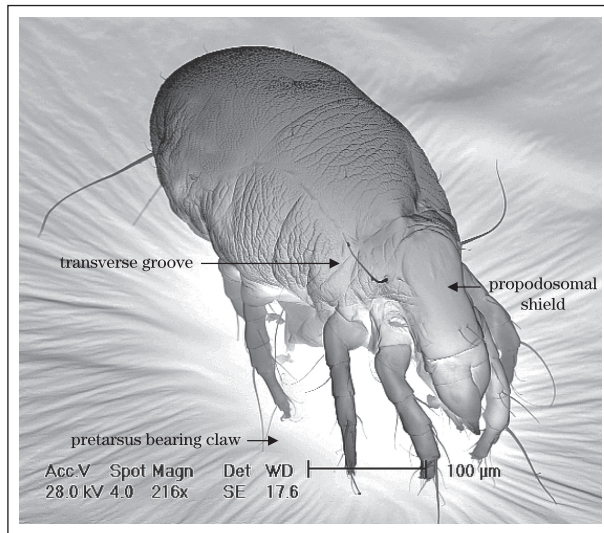


Figure 1. *Suidasia pontifica* ♂, a minute scaly mite

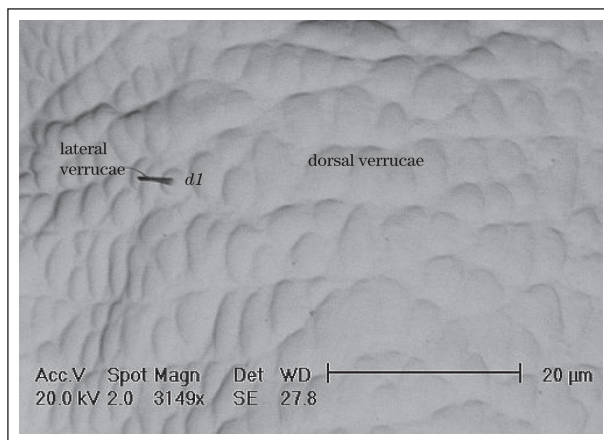


Figure 2. Dorsal idiosoma of *S. pontifica* with cuticle uniformly covered with small and elongate verrucae

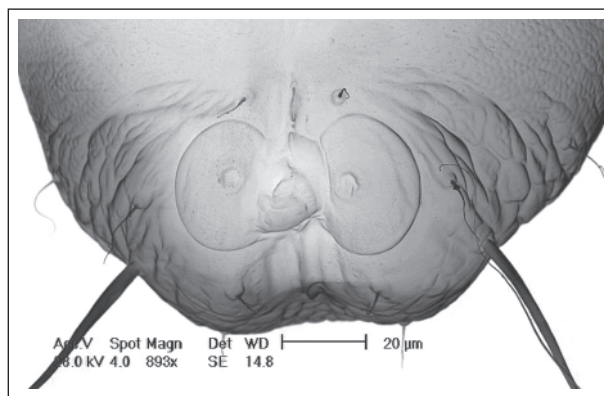


Figure 3. *S. pontifica* ♂. Ventral opisthosoma showing bigger verrucae

sinuous lateral borders (Figure 4). A pair of external vertical setae, *ve* arises near the middle of the lateral edge of the propodosomal shield. The *ve* are fine and arise posterior to internal vertical setae, *vi*. The latter setae, *vi* are thicker and at least twice the length of *ve*. The position of *ve* is in between *vi* and supracoxal setae, *ps*. The latter setae are expanded and thickly

pectinate (Figure 5). Like other Saproglyphids, the mite has a pair of long scapular external setae (*sce*) extending from the outer margin of the idiosoma and a pair of shorter scapular internal setae (*sci*) on the inner part of the idiosoma. *Sce* are usually about six times longer than *sci*. The *sci* are considerably nearer to *sce* than to each other (Figure 6).

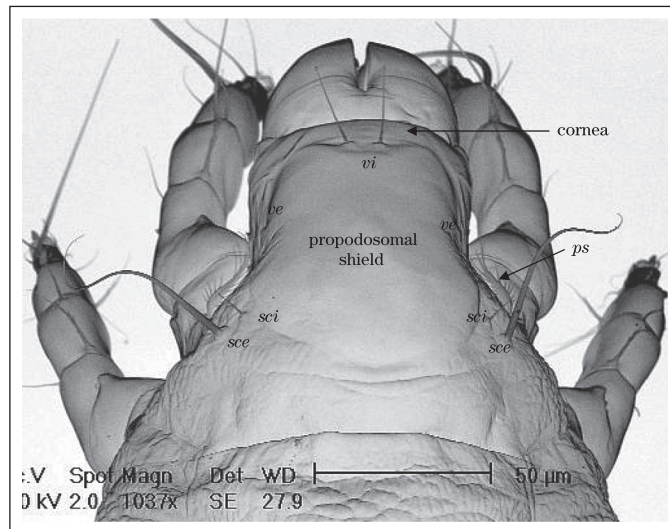


Figure 4. *S. pontifica* ♀. Propodosomal region showing position of external vertical setae (*ve*), internal vertical setae (*vi*), external scapular setae (*sce*), internal scapular setae (*sci*) and supracoxal setae (*ps*)

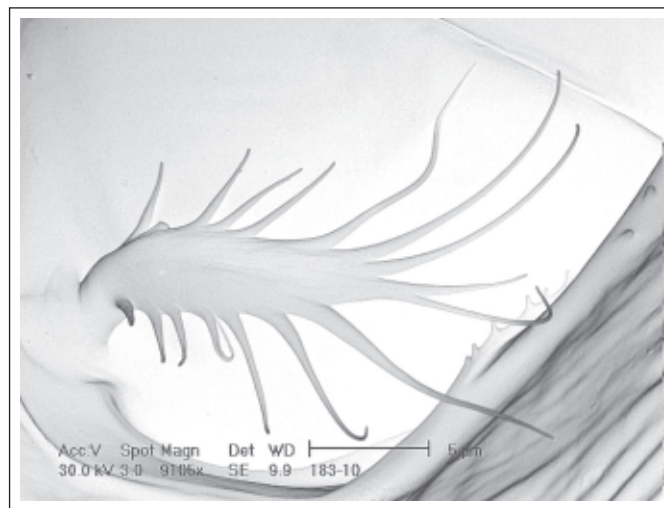


Figure 5. Supracoxal setae of *S. pontifica* ♀

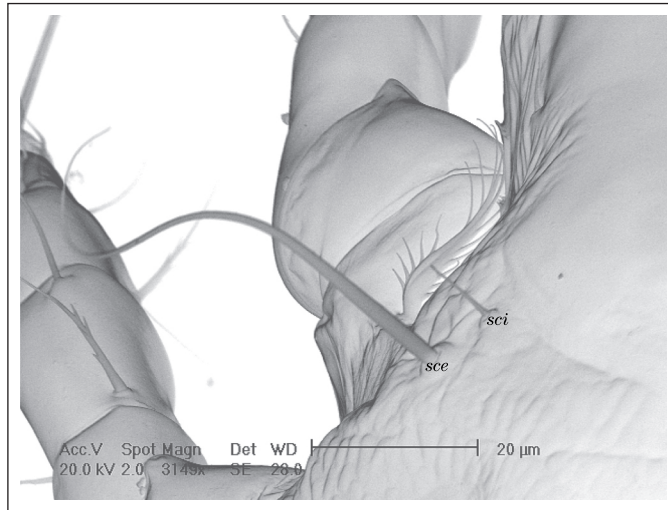


Figure 6. Differences in length of external scapular setae (*sce*) and internal scapular setae (*sci*) of *S. pontifica* ♀

The species has short setae on the dorsal and lateral surfaces of the hysterosoma. Dorsal setae, *d1* to *d4* are arranged almost in linear series with one another (Figure 7). There is a dorsal transverse groove dividing the propodosoma from the hysterosoma (Figure 7). Gnathosoma of *S. pontifica* is composed of a pair of palps and chelicerae which are supported by a subcapitulum (Figure 8). The palps are simple two-

segmented structures with sensory hairs. The chelicerae are three-segmented; the third segment is dentate. Their legs are stout, all ending in a claw recurved from apex of the tarsus. On the apex of tarsus I, there are 3 ventral spines but no dorsal spine (Figure 9).

Sexual dimorphism

Ventrally, the anal opening is long and reaches the posterior margin of the body. The male

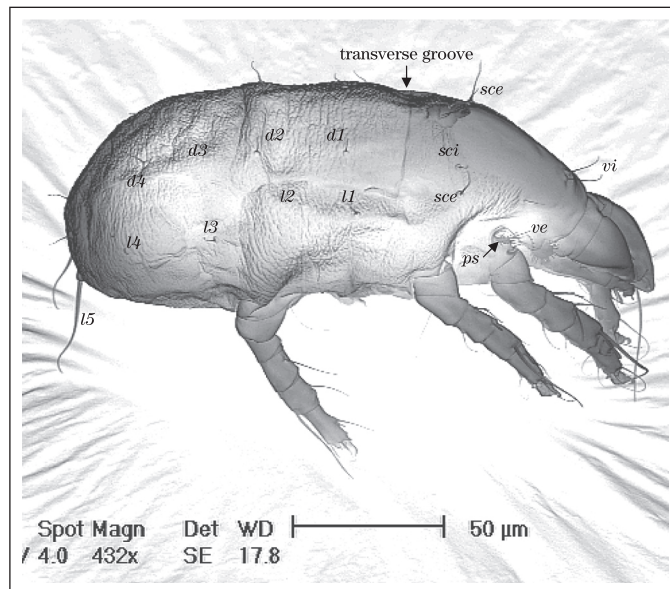


Figure 7. Dorsal and lateral setae of a female *S. pontifica*

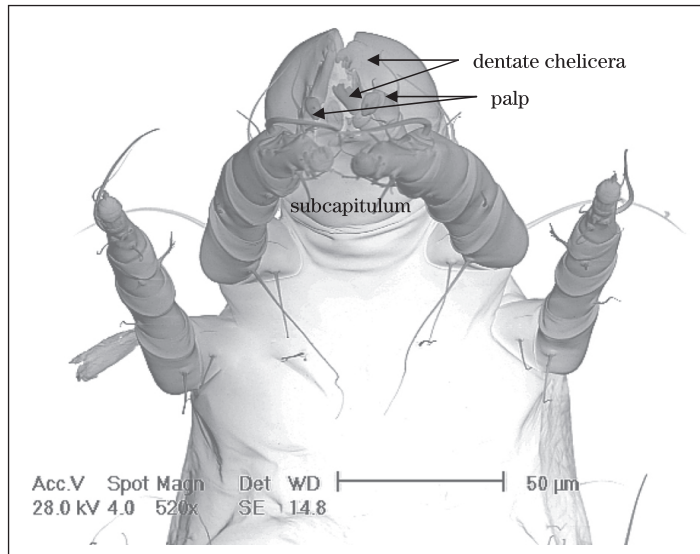


Figure 8. *S. pontifica* ♂. Anterior region of gnathosoma showing chelicera and palp

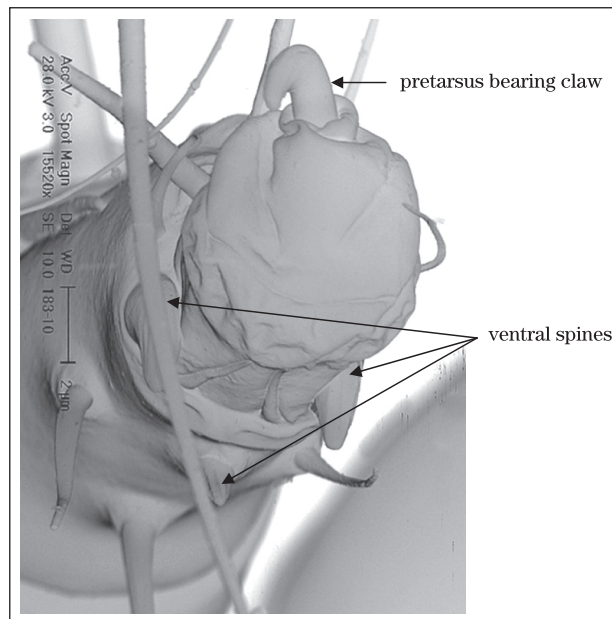


Figure 9. *S. pontifica* ♀. Tarsus I with 3 ventral spines (5351x)

anal opening is flanked by a pair of large, flat and oval-shaped anal suckers (Figure 10). Adult females have a complex sclerotized bursa copulatrix close to the posterior margin of body that formed on 2 pouches. The outer pouch is being prolonged by a very narrow tubule (Figure 11). In both sex, the anal

opening is surrounded by 3 pairs of anal setae. In male mites, the pairs of anal setae encircle the anal suckers. However, all anal setae in females are arranged in linear position on either side of the anus (Figure 12).

Genital opening of both sexes of *S. pontifica* is located between coxae III and IV.

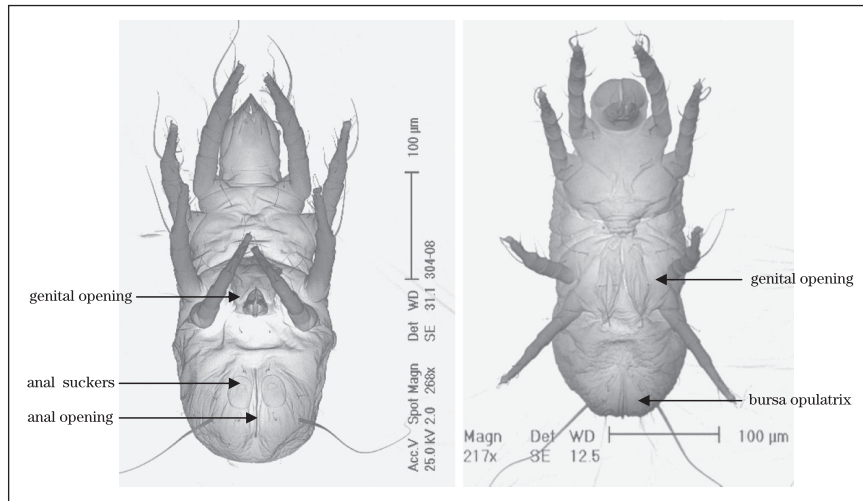


Figure 10. Ventral of male (left) and female *S. pontifica* (right) showing terminal opening and genital regions

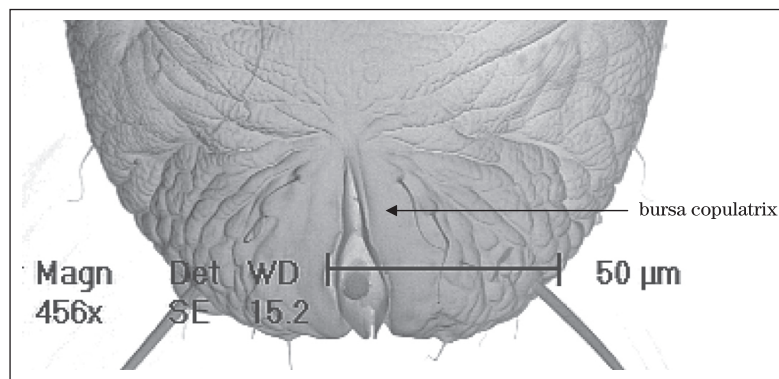


Figure 11. Ventral of female *S. pontifica* showing external terminal opening and copulatory vestibule

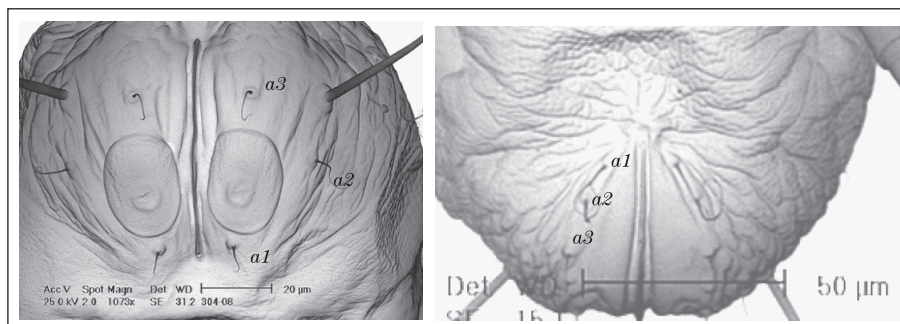


Figure 12. Position of anal setae in male (left) and female *S. pontifica* (right)

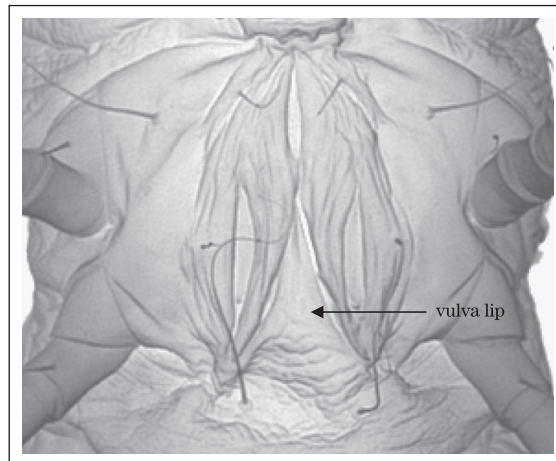


Figure 13. Ventral of female *S. pontifica* showing genital opening

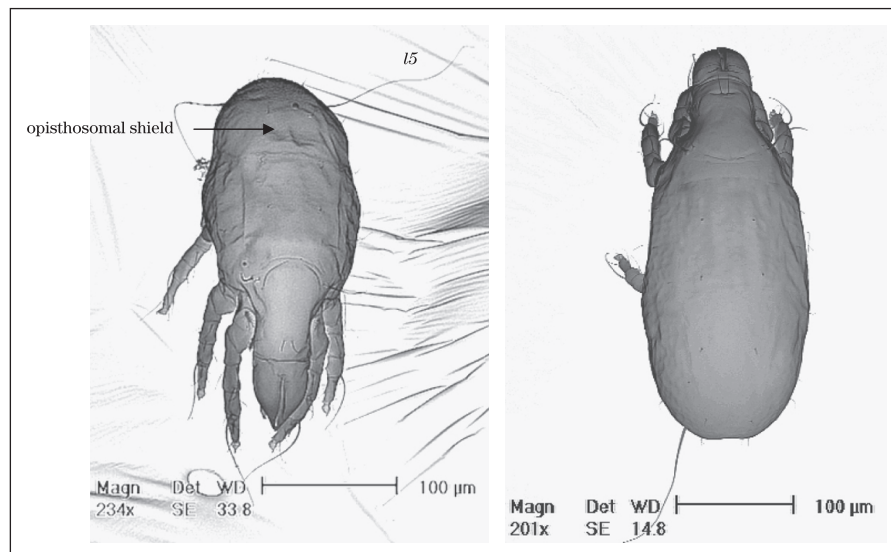


Figure 14. Opisthosomal shield in female (left) but absent in male *S. pontifica* (right)

Females possess a long vulva lip and their genital opening is covered by two paragnyal flaps. The shape of the genital opening is an inverted “V” (Figure 13). A dorsal opisthosomal shield is present in female *S. pontifica* mites (Figure 14) but absent in male mites. All dorsal setae in male mite are short and very thin. In females, all dorsal setae are also short except for lateral setae, *l 5* which are long (Figure 14).

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