Sensory projections of pectines in the scorpion nervous system

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Pectines are specialized comb-like structures located on the ninth body segment of scorpions, which are used to probe the substrate for chemosensory and mechanosensory information. In this study, sensory projections of single pegs of the pectines of *Mesobuthus eupeus* were analyzed by backfilling techniques, combined with immunohistological labeling of neuropilar regions. Staining of neuropil areas revealed the lobular organization of the primary posterior pectine neuropil and a second homogenously structured anterior neuropil. Sensory projections of each peg innervated distinct parts of the primary neuropil: Afferents of distal pegs projected into medial areas, whereas afferents of proximal pegs projected into lateral areas. After leaving the posterior pectine neuropil the axon bundles terminated in an anterior neuropil, with no distinct somatotopic distribution. The somatotopic organization of chemosensory afferents in the primary pectine neuropil suggests that the peg arrangement serves for differential perception of chemical gradients on the substrate, which might support orientation based on substrate-born signals.