

Table S1. Comparisons of rhabdom organization of ommatidia among representatives of Cucujiformia.

Species	Family/ subfamily	Rhabdom type	Relationship between PR and CR	Arrangement of PR	Arrangement of CR	Contribution to CR by R7 and R8	Orientation of microvilli in PR	Orientation of microvilli in PR	Polarization sensitivity	Reference
<i>Tbanasimus formicarius</i>	Cleridae	open	contacted	fused	fused	unequal	perpendicular	multiple	?	Wachmann (1977) [2]
<i>Trichodes apiarius</i>	Cleridae	open	isolated	fused	fused	unequal	multiple	multiple	-	Wachmann (1977) [2]
<i>Clerus mutillarius</i>	Cleridae	open	contacted distally, isolated basally	distally fused	fused	equal	parallel	multiple	-	Wachmann (1977) [2]
<i>Neotriplax lewisi</i>	Erotylidae	open	contacted	fused	vertically aligned	unequal	perpendicular	perpendicular	+	Mishra and Meyer- Rochow (2006) [32]
<i>Donacia simplex</i>	Donaciinae	open	isolated	fused	fused	equal	parallel	perpendicular	+	Wachmann (1977) [2]
<i>Lema lichenis</i>	Crioerinae	open	isolated	fused	fused	equal	parallel	multiple	-	Wachmann (1977) [2]
<i>Adoxus obscurus</i>	Eumolpinae	open	isolated	fused	fused	equal	parallel	multiple	-	Wachmann (1977) [2]
<i>Orsodacne cerasi</i>	Orsodacninae	open	isolated	fused	fused	unequal	multiple	multiple	-	Wachmann (1977) [2]
<i>Zeugopora flavicollis</i>	Megalopodinae	open	isolated	fused	fused	unequal	multiple	multiple	-	Wachmann (1977) [2]
<i>Cassida vibex</i>	Hispinae	open	isolated	fused	fused	equal	multiple	multiple	-	Wachmann (1977) [2]
<i>Clytra laeviuscula</i>	Clytrinae	open	isolated	fused	fused	equal	perpendicular	multiple	?	Wachmann (1977) [2]
<i>Agelastica alni</i>	Galerucinae	open	isolated	fused	fused	unequal	multiple	multiple	-	Wachmann (1977) [2]
<i>Agasicles hygrophila</i>	Galerucinae	open	isolated	fused	fused	unequal	multiple	multiple	-	Fan et al. (2023) [14]
<i>Asiophrida xanthospilota</i>	Galerucinae	open	isolated	fused	segmented	R8 absent	multiple	multiple	-	current study
<i>Callosobruchus maculatus</i>	Bruchinae	open	isolated	fused	fused	equal	multiple	multiple	-	Du et al. (2023) [13]
<i>Melasoma aenea</i>	Chrysomelinae	open	isolated	fused	fused	equal	parallel	perpendicular	+	Wachmann (1977) [2]
<i>Chrysomela varians</i>	Chrysomelinae	open	contacted	fused	fused	equal	parallel	multiple	-	Wachmann (1977) [2]
<i>Phytodecta viminalis</i>	Chrysomelinae	open	contacted	fused	fused	equal	parallel	multiple	-	Wachmann (1977) [2]
<i>Timarcha tenebricosa</i>	Chrysomelinae	open	contacted	fused	segmented	unequal	perpendicular	multiple	?	Wachmann (1977) [2]
<i>Anaglyptus mysticus</i>	Cerambycinae	open	isolated	fused	fused	equal	parallel	multiple	-	Wachmann (1977) [2], Wachmann (1979) [35]

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<i>Xylotrechus arvicola</i>	Cerambycinae	open	isolated	fused	fused	equal	parallel	multiple	-	Wachmann (1979) [35]
<i>Plagionotus arcuatus</i>	Cerambycinae	open	isolated	isolated	fused	equal	parallel	multiple	-	Wachmann (1979) [35]
<i>Demonax transilis</i>	Cerambycinae	open	isolated	isolated	fused	equal	parallel	multiple		Gokan & Hosobuchi (1979) [34]
<i>Stenopterus ater</i>	Cerambycinae	open	isolated	significantly reduced	fused	unequal	multiple	multiple	-	Wachmann (1979) [35]
<i>Anaglyptus mysticus</i>	Cerambycinae	open	isolated	loosely fused	fused	equal	parallel	multiple	-	Wachmann (1979) [35]
<i>Molorchus minor</i>	Cerambycinae	open	contacted	fused	fused	unequal	parallel	multiple	-	Wachmann (1979) [35]
<i>Paraclytus exculus</i>	Cerambycinae	open	contacted	fused	fused	equal	parallel	multiple	-	Gokan & Hosobuchi (1979) [34]
<i>Strangalia nigra</i>	Lepturinae	open	isolated	isolated	fused	equal	parallel	multiple	-	Wachmann (1979) [35]
<i>Grammoptera sp.</i>	Lepturinae	open	isolated	isolated	fused	equal	parallel	multiple	-	Wachmann (1979) [35]
<i>Strangalia sp.</i>	Lepturinae	open	isolated	isolated	fused	equal	parallel	multiple	-	Wachmann (1979) [35]
<i>Leptura ochraceofasciata</i>	Lepturinae	open	isolated	isolated	fused	equal	parallel	multiple	-	Gokan & Hosobuchi (1979) [34]
<i>Pidonia puziloi</i>	Lepturinae	open	isolated	isolated	fused	equal	parallel	multiple	-	Gokan & Hosobuchi (1979) [34]
<i>Stenocorus meridianus</i>	Lepturinae	open	isolated	isolated	fused	unequal	multiple	multiple	-	Wachmann (1979) [35]
<i>Tetrops praeusta</i>	Lamiinae	/	/	completely absent	fused	equal	parallel	/	-	Wachmann (1979) [35]
<i>Dorcatypus tristis</i>	Lamiinae	open	contacted	fused	segmented	unequal	perpendicular	perpendicular	+	Wachmann (1979) [35]
<i>Mesechthisfatus fujisanus</i>	Lamiinae	open	contacted	fused	segmented	unequal	perpendicular	perpendicular	+	Gokan & Hosobuchi (1979) [34]
<i>Agapanthia villosoviridescens</i>	Lamiinae	open	contacted	fused	fused	equal	parallel	multiple	-	Wachmann (1979) [35]
<i>Monochamus alternatus</i>	Lamiinae	open	contacted	fused	fused	equal	perpendicular	perpendicular	+	Wen et al. (2020) [6]
<i>Nupserha marginalis</i>	Lamiinae	open	isolated	fused	fused	equal	parallel	multiple	-	Gokan & Hosobuchi (1979) [34]

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<i>Agapanthia cardui</i>	Lamiinae	fused	fused	fused	fused	equal	parallel	multiple	-	Wachmann (1979) [35]
<i>Ergates faber</i>	Prioninae	open	contacted	fused	segmented	equal	parallel	perpendicular	+	Wachmann (1979) [35]
<i>Distenia gracilis</i>	Disteniinae	open	contacted	fused	fused	equal	parallel	multiple	-	Gokan & Hosobuchi (1979) [34]

Abbreviation: PR, peripheral rhabdomeres; CR, central rhabdomeres.