

Summary 'cheat sheet' for Australian SPHECIFORMES (with emphasis on Crabronidae identification)

		Australian genera (number species)			EYES		ocelli normal or other	antennae	forewing submarginal cells	other wing features	gaster	other features	typical prey	sex specifics			
AMPULICIDAE	Dolichurinae	<i>Aphelotoma</i> (8), <i>Riekkefella</i> (1), <i>Dolichurus</i> (4)	notauli (longitudinal grooves on pronotum) deep & complete	4-14mm; rapid flight, alighting on sunny leaves in forests	entire		normal	low on face	2-3	forewings banded in <i>Aphelotoma</i> & <i>Riekkefella</i>	cerci present	metallic green-blue	cockroaches	male 11, female 10 flagellomeres			
	Ampulicinae	<i>Ampulex</i> (1)						low on face, each socket with an overhanging frontal lobe		cerci absent; apex of gaster in female laterally compressed							
SPHECIDAE	Sceliphrinae	<i>Sceliphron</i> (3), <i>Chalybion</i> (1)	thread-waisted wasps	<i>Chalybion</i> : metallic blue; <i>Sceliphron</i> : black with yellow markings ('mud-daubers')	entire		normal	scape short, globose to elongate oval	3	hind wing large jugal lobe;	cylindrical petiole		spiders	male 11, female 10 flagellomeres			
	Sphecinae	<i>Sphecx</i> (35), <i>Isodontia</i> (8)		large, robust; collar short, high				straight & converging below, or parallel; concave above, converging at level of ocelli		scape usually short, stout					3		katydids & grasshoppers
	Ammophilinae	<i>Ammophila</i> (6), <i>Parasammophila</i> (1), <i>Podalonia</i> (1)		female labrum with long setae				essentially straight or broadly convex		scape ovate to slender & parallel sided					3 (but 2 in <i>Ammophila</i>)		caterpillars
CRABRONIDAE																	
Pempredoninae		<i>Polemistus</i> (1), <i>Spilomena</i> (10), <i>Arpactophilus</i> (22), <i>Paracrabro</i> (1), <i>Psenulus</i> (2), <i>Allostigmus</i> (2), ? <i>Ceratostigmus</i> (1) - ?	med-small to tiny; cuboidal head; clypeus often very short; single mid-tibial spur	notauli usually present, may be long			essentially parallel, with some convergence above & below	normal	low on face or near middle	no more than 2	forewing media diverging after cu-a	metasoma sessile in many Australian species (petiolate in some)	homoptera	male 11, female 10 flagellomeres			
Crabroninae	Larrini	<i>Larra</i> (4), <i>Liris</i> (15), <i>Diachnorrhina</i> (1), <i>Tachytes</i> (12), <i>Tachysphex</i> (40)	mid-tibia with single apical spur	medium sized, fossorial, most 'somber coloured' but gaster may have covering of silver or gold hairs	entire (I assume)		converging above	hind ocelli reduced to opaque scars, mid ocellus often small	low on face, contiguous with frontoclypeal suture (or narrowly separated from it) (some <i>Tachytes</i> a little more removed)	3	cell II may be petiolate in some <i>Larra</i>	jugal lobe of hindwing large	sessile	larger, hairy <i>Tachytes</i> are rather bee-like	Orthoptera (mostly)	male 11, female 10 flagellomeres	
	Miscophini	<i>Sphodrotes</i> (12), <i>Sericophorus</i> (95), <i>Lyroda</i> (4), <i>Nitela</i> (4), <i>Auchenophorus</i> (3), <i>Larriusson</i> (15)		many converge above - some parallel. If hint of converging below it is very slight.	normal	entire		scape much less than half flagellar length (cf Crabronini)	low on face, convergent with frontoclypeal suture	3 (<i>Lyroda</i> , <i>Sphodrotes</i> , most <i>Sericophorus</i> , <i>Larriusson</i>) 2 (<i>Sericophorus frontalis</i>) 1 (<i>Nitela</i> , <i>Auchenophorus</i>)			hind femora widest in middle (or base), tapering to a simple apex	Varied: Hemiptera (<i>Sphodrotes</i>) Diptera (<i>Sericophorus</i>) Orthoptera (<i>Lyroda</i>) Psocoptera (<i>Nitela</i>)	male 11, female 10 - but in <i>Sericophorus</i> male has just 10		
	Trypoxylonini	<i>Trypoxylon</i> (8)					angularly emarginate (notched)	above, below or parallel	normal	antennal sockets near middle of face, not contiguous with frontoclypeal suture	1		segment I slender (length usually 2x or more apical width); only TI with lateral carina (may be feeble); gaster clavate, often petiolate	spiders	most nest in pre-existing cavities (very few are fossorial)	male 11, female 10 flagellomeres	
		<i>Pison</i> (173)							low on face, contiguous with frontoclypeal suture	usually 3, with II petiolate & may be reduced; some with just 2	marginal cell apex acuminate (pointed), & usually well beyond end of last submarginal cell		usually sessile, compact, TI-II with lateral carina	pronotum & propleuron often with peculiar carinae and/or sulci	males help in nest building in some species		
Crabronini	<i>Rhopalum</i> (99), <i>Podagritys</i> (30)	mid-tibia with single apical spur (occasionally none)	large cuboidal head; stout thorax & legs; 2-14mm	entire of only slightly emarginate - not notched			usually converge below; eye facets usually enlarged ventrad, crowding the antennal sockets	normal	scape ~ 1/2 flagellum length	1	marginal cell apex truncate or rounded	pedunculate & slender; TI often nodose at apex	pronotal lobe does not reach tegula; collar short; face often with silvery transverse clypeus & vertical pale scapes forming a distinctive U shape	Diptera (mostly)	male 11, female 10 (except male 10 in <i>Lestica</i> & most <i>Ectemnius</i>)		
	more sessile & robust																
	small, reddish or dark; sessile																
	<i>Aha</i> (1); <i>Aulacophilinus</i> (4), <i>Euphloides</i> (4), <i>Larrius</i> (1), <i>Zuthopalum</i> (4)	newer genera: yet to check diagnostics															
Bembicinae	Nyssonini	<i>Acanthostethus</i> (15)		heavily sclerotised with posterolateral spines on propodeum; 5-9mm	entire			basal articles slender	2		stout		cleptoparasitic on <i>Sericophorus</i>				
	Bembicini	<i>Exeirus</i> (1), <i>Argogorytes</i> (4), <i>Ciltemnestra</i> (11), <i>Austrogorytes</i> (31), <i>Ammatomus</i> (3), <i>Sphecius</i> (1)	mid-tibia with 2 apical spurs (except in some males of <i>Austrogorytes</i> , which have 1)	rather distinctive, erratic flight ... decelerating as they circle bushes, almost hovering			converging below or sometimes as close above as below	well developed	3	cell II not petiolate (except in <i>Exeirus</i>)	segment I may be constricted or pedunculate	pygidial plate usually distinct & wedge-shaped; labrum not prominent	typically Hemiptera ('hoppers') - nymphs & adults				
		<i>Bembecinus</i> (7)	all are ground-nesters, most in sand	size 5-11mm; nest in hard soil/sand, sometimes in large colonies	converging below, often strongly			well developed; moderate convexity below midocellus, no special hump	3	cell I greatly elongated before stigma	forewing media diverging before or close to cu-a	male: T VII visible, with laterobasal spiracular lobes; & SVIII with 3 distal prongs	propodeum compressed & sharply edged lateroposteriorly, the edge usually notched below	typically Hemiptera (eg leafhoppers)	male 11, female 10 (I assume - not stated for all genera)		
	<i>Bembix</i> (84)	mid-tibia with 1 apical spur (except in some males, which have none)	classic sand wasp behaviour (swift linear flight, cruising & darting in chase); nest in hard soil/sand, gregariously	essentially parallel, diverging slightly below			vertex depressed alongside eyes, but may rise again centrally!	ocellar lenses greatly reduced, virtually absent (rare exceptions)!	3	cell I greatly elongated before stigma	forewing media diverging before cu-a (but sometimes very close to cu-a)	male: T VII visible, with laterobasal spiracular lobes & SVIII ending in a downcurved spine	Diptera (mostly)				
Philanthinae	<i>Cerceris</i> (50)		often colourful, with coarse sculpturing; gaster constricted between segments; head wide; hind femur apically expanded and flattened	not notched, somewhat bowed toward each other			slightly or strongly converging above; widely separated	normal	sockets divided by strongly raised ridge; subantennal sclerite nearly always defined by lines from antennal sockets to clypeus	3	II nearly always petiolate	first segment usually peduncle or narrow petiole	5-25mm	mostly adult Coleoptera	clypeus of female often with distal teeth or other projections; female sternum VI usually deeply cleft at apex; pygidial plate similar in both sexes		

Drawing upon the following: Bohart & Menke (1976) *Sphecid Wasps of the World: A generic revision*; Naumann, I.D. (1991) Hymenoptera. *Insects of Australia* (Chapter 42), CSIRO; Australian Faunal Directory, ABRIS: Evans, H.E. & Matthews, R.W. 1973. Systematics and nesting behavior of Australian *Bembix* sand wasps (Hymenoptera, Sphecidae). *Memoirs of the American Entomological Institute* 20: iv, 1-387 (indicated with #)
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