Table S1. Evidence for the NWR pattern employed by some insects for nitrogen provisioning.

Insect	Nutritional supplies	developmental Stage	Functional bacteria	Bacteria Location	Nitrogenous waste	Methods	Reference
Blattaria: Cryptocercidae-*Periplaneta americana*	Omnivorous	Adult	*Blattabacterium cuenoti*	Fat body (Intracellular)	Ammonia, urea	Genomic analysis	[1, 2]
Blattaria: Cryptocercidae-*Periplaneta fuliginosa*	Omnivorous	Adult	*Blattabacterium* spp.	Fat body (Intracellular)	Ammonia, urea	Genomic analysis	[3]
Blattaria: Cryptocercidae-*Periplaneta japonica*	Omnivorous	Adult	*Blattabacterium* spp.	Fat body (Intracellular)	Ammonia, urea	Genomic analysis	[3]
Blattaria: Blattellidae-*Blattella germanica*	Omnivorous	Adult	*Blattabacterium cuenoti*	Fat body (Intracellular)	Ammonia, urea	Transcriptome analysis	[4]
Blattaria: Mastotermitidae-*Mastotermes*	Xylophagous	Adult	*Blattabacterium cuenoti*	Fat body; Hindgut	Ammonia, urea	Genomic analysis	[5, 6]

darwiniensis							
Blattaria: Rhinotermitidae-*Reticulitermes flavipes*	Xylophagous	Adult	*Streptococcus* sp.; *Bacteroides*; *Termitidis*; *Citrobacter*	Hindgut	Uric acid	Assimilation: ^{15}N-labeled uric acid; Biochemical tests (Enzyme assays)	[7, 8]
Blattaria: Rhinotermitidae-*Coptotermes formosanus*	Xylophagous	Adult	Bacteroidales	Gut	Ammonia, urea	Genomic analysis	[9]
Other wood-feeding termites (i.e. *Reticulitermes speratus*, *Coptotermes formosanus*,	Xylophagous	Adult	*Clostridia*; Enterobacteriaceae; Low G+C Gram-positive cocci	Gut	Uric acid	Uric acid-degrading bacteria isolation	[10]

Neotermes koshunensis, *Glyptotermes fuscus*, *Cryptotermes domesticus*, *Hodotermopsis sjoestedti*, *Odontotermes formosanus*, *Nasutitermes takasagoensis*)							
Coleoptera: Curculionidae-	Phloem	Adult; larva	*Serratia proteomaculans*;	Gut	Uric acid	Biochemical tests (Enzyme assays)	[11]

Dendroctonus rhizophagus			*Rahnella aquatilis*				
Coleoptera: Curculionidae-*Dendroctonus valens*	Phloem	Adult; larva	*Pseudomonas fluorescens*; *Serratia proteomaculans*; *Rahnella aquatilis*	Gut	Uric acid	Biochemical tests (Enzyme assays)	[11]
Coleoptera: Cerambycidae-*Anoplophora glabripennis*	Xylophagous	Larva; egg	Enterobacteriaceae	Gut	Urea	Assimilation: ^{15}N-labeled urea; Culture-independent approaches	[12]
Coleoptera: Scarabaeidae-*Melolontha hippocastani*	Root or leaf	Adult; larva	*Burkholderia*; *Parabacteroides*	Gut	Urea	Metagenome analysis; Assimilation: ^{15}N-labeled urea	[13]
Diptera: Stratiomyidae-*Hermetia illucens*	Organic waste	Larva	No highlight bacteria	Presumption in gut	Ammonia	Calculated biomass conversion ratio	[14]
Diptera: Tephritidae-*Bactrocera oleae*	Polyphagous	Adult female	*Candidatus* Erwinia dacicola	Gut	Urea	Monitored female fecundity	[15]
Diptera: Tephritidae-*Anastrepha ludens*	Polyphagous	Adult	*Enterobacter agglomerans*	Gut	Uric acid	Attraction assays	[16]
Diptera:	Rosaceae fruit	Adult	*Enterobacter*	Gut	Uric acid	Attraction assays	[17]

Tephritidae-*Rhagoletis pomonella*			*agglomerans*				
Diptera: Drosophilidae-*Drosophila melanogaster/ suzukii*	Polyphagous	Adult	*Acetobacter*	Gut	Uric acid	Genomic analysis; Biochemical tests (Enzyme assays)	[18]
Hemiptera: Aphididae-*Acyrthosiphon pisum*	Phloem sap	Larva	*Buchnera*	Bacteriocytes	Ammonia	Metabolite profile analysis	[19, 20]
Hemiptera: Parastrachiidae-*Parastrachia japonensis*	Monophagous (The drupes of *Shoepfia jasminodora*)	Nymph; adult	*Erwinia*-like bacteria	In the cecum of midgut	Uric acid	Biochemical tests (Enzyme assays)	[21]
Hemiptera: Delphacidae-*Nilaparvata lugens*	Monophagous (Rice sap)	Adult	Yeast-like symbionts	Intracellular	Uric acid	Biochemical tests (Enzyme assays);	[22, 23]
Hemiptera: Dactylopiidae-*Dactylopius coccus*	Cactus sap	Adult; egg; embryo	*Candidatus* Dactylopiibacterium carminicum; Uricolytic fungal: Rhodotorula, Cryptococcus,	Ovary;gut; egg surface	Uric acid	Genomic analysis; Biochemical tests (Enzyme assays); FISH	[24, 25]

			Trametes, Penicillium, Debaryomyces				
Hemiptera: Dactylopiidae-*Dactylopius opuntiae*	Cactus sap	Adult; egg; embryo	*Candidatus* Dactylopiibacterium carminicum; Uricolytic fungal: Rhodotorula, Cryptococcus, Trametes, Penicillium, Debaryomyces	Ovary;gut; egg surface	Uric acid	Genomic analysis; Biochemical tests (Enzyme assays); FISH	[24, 25]
Hymenoptera: Formicidae-*Camponotus floridanus*	Omnivorous	Adult; Larva; pupa; egg	*Blochmannia floridanus*	Bacteriocytes in midgut or ovary	Urea	Functional genes identification (*ureC*, *ureF*, *glnA*, and *speB*); Assimilation: ^{15}N-labeled urea	[26, 27]
Hymenoptera: Formicidae-*Camponotus compmssus*	Omnivorous	Adult	No highlight bacteria	Gut	Urea	Selection behaviors test	[28]
Hymenoptera: Formicidae-*Cephalotes varians*	Herbivorous	Adult	Burkholderiales; Opitutales; Rhizobiales	Gut	Urea, Uric acid	Metagenome analysis; Assimilation: ^{15}N-	[29]

						labeled urea	
Hymenoptera: Formicidae- *Cephalotes* species (i.e. *Cephalotes angustus*, *C. atratus*, *C. clypeatus*, *C. eduarduli*, *C. grandinosus*, *C. maculatus*, *C. minutus*, *C. pallens*, *C. pellans*, *C. persimilis*, *C. pusillus*, *C. rohweri*, *C. similimus*, *C. spinosus*, *C. umbraculatus*, *C. persimplex*)	Herbivorous	Adult	Burkholderiales; Opitutales; Rhizobiales	Gut	Urea, Uric acid	Metagenome analysis	[29]
Hymenoptera: Formicidae- *Dolichoderus* species	Plant exudates	Adult	Bartonellaceae	Midgut	Urea, uric acid	Genomic analysis	[30, 31]

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