

**Ants as bioindicators of ecosystem health in Shivalik Mountains of Himalayas:
assessment of species diversity and invasive species**

BHARTI, H., BHARTI, M. & PFEIFFER, M.

Species composition of the ant communities in the three studied habitats. Given are collected specimens. Invasive species are marked with * (or ° when they were in their native range and thus not considered invasives), endemic species are marked with #.

Species	Primary forest	Secondary forest	Non- forest	Total
<i>Crematogaster anthracina</i> Smith, 1857	7	23	11	41
<i>Crematogaster binghamii</i> Forel, 1904	9	22	7	38
<i>Crematogaster biroi smythiesii</i> Forel, 1902	3	3	8	14
<i>Crematogaster flava</i> Forel, 1886	4	6	7	17
<i>Crematogaster rothneyi</i> Mayr, 1879	4	19	8	31
<i>Crematogaster sagei</i> Forel, 1902	7	9	0	16
<i>Crematogaster subnuda</i> Mayr, 1879	13	25	12	50
<i>Monomorium aberrans</i> Forel, 1902	5	19	4	28
* <i>Monomorium destructor</i> (Jerdon, 1851)	10	9	10	29
* <i>Monomorium floricola</i> (Jerdon, 1851)	0	6	0	6
<i>Monomorium glabrum</i> (Andre, 1883)	3	13	4	20
<i>Monomorium indicum</i> Forel, 1902	5	14	13	32
° <i>Monomorium latinode</i> Mayr, 1872	1	0	0	1
° <i>Monomorium monomorium</i> Bolton, 1987	1	0	3	4
<i>Monomorium orientale</i> Mayr, 1879	7	6	4	17
* <i>Monomorium pharaonis</i> (Linnaeus, 1758)	0	5	5	10
<i>Monomorium sagei</i> Forel, 1902	4	3	6	13
<i>Monomorium scabriceps</i> (Myar, 1879)	3	23	6	32
<i>Myrmicaria brunnea</i> Saunders, 1842	4	8	9	21
<i>Pheidole indica</i> Mayr, 1879	4	4	7	15

<i>Pheidole jucunda fossulata</i> Forel,1902	6	5	0	11
<i>Pheidole latinoda major</i> (Forel, 1885)	13	13	12	38
<i>Pheidole parva</i> Mayr, 1865	3	0	6	9
<i>Pheidole pronotalis</i> Forel, 1902	0	4	0	4
<i>Pheidole sagei</i> Forel, 1902	7	4	0	11
<i>Pheidole sharpi</i> Forel, 1902	8	0	0	8
<i>Pheidole smythiesii</i> Forel, 1902	0	11	5	16
# <i>Pheidole spathifera aspatha</i> (Forel, 1902)	0	0	4	4
<i>Pheidole woodmasoni</i> Forel, 1885	6	7	7	20
* <i>Cardiocondyla nuda</i> (Mayr, 1866)	14	14	5	33
* <i>Cardiocondyla wroughtonii</i> (Forel, 1890)	6	5	7	18
# <i>Lepisiota annandalei</i> (Mukerjee, 1930)	4	11	6	21
<i>Lepisiota bipartita</i> (Smith,F. 1861)	4	16	10	30
<i>Lepisiota capensis</i> (Mayr, 1862)	7	7	3	17
<i>Lepisiota capensis simplex</i> (Forel, 1892)	6	10	0	16
# <i>Lepisiota frauenfeldi integra</i> (Forel, 1894)	0	3	0	3
# <i>Lepisiota</i> sp.n.	0	1	0	1
# <i>Lepisiota modesta</i> (Forel, 1894)	0	11	3	14
<i>Lepisiota opaca</i> (Forel, 1892)	0	9	0	9
<i>Lepisiota opaca pulchella</i> (Forel, 1892)	18	17	7	42
<i>Lepisiota rothneyi wroughtonii</i> (Forel, 1902)	13	0	6	19
<i>Lepisiota sericea</i> (Forel, 1892)	0	15	4	19
<i>Nylanderia birmana</i> (Forel, 1902)	14	11	0	25
# <i>Nylanderia</i> sp.n.	0	1	0	1
<i>Nylanderia indica</i> (Forel, 1894)	12	13	0	25
# <i>Nylanderia smythiesii</i> (Forel, 1894)	20	14	25	59
<i>Nylanderia taylori</i> (Forel, 1894)	4	4	6	14
<i>Nylanderia yerburyi</i> (Forel, 1894)	11	0	0	11
* <i>Ochetellus glaber</i> (Mayr, 1862)	0	7	0	7
<i>Odontoponera denticulata</i> (Smith,F. 1858)	20	24	22	66
<i>Plagiolepis moelleri</i> Bingham, 1903	11	0	0	11
* <i>Paratrechina longicornis</i> (Latreille, 1802)	14	21	20	55
* <i>Tapinoma melanocephalum</i> (Fabricius, 1793)	15	17	8	40

* <i>Technomyrmex albipes</i> (Smith, 1861)	11	10	3	24
<i>Technomyrmex elatior</i> Forel, 1902	0	10	1	11
<i>Technomyrmex rector</i> Bolton, 2007	8	14	7	29
* <i>Tetramorium bicarinatum</i> (Nylander, 1846)	5	2	0	7
* <i>Tetramorium caespitum</i> (Linnaeus, 1758)	0	2	0	2
* <i>Tetramorium caldarium</i> (Roger, 1857)	0	0	6	6
<i>Tetramorium coonoorensense</i> Forel, 1902	2	0	0	2
* <i>Tetramorium lanuginosum</i> Mayr, 1870	7	10	5	22
<i>Tetramorium obesum</i> André, 1887	0	1	0	1
<i>Tetramorium shivalikense</i> Bharti & Kumar, 2012	5	6	9	20
* <i>Tetramorium simillimum</i> (Smith, F. 1851)	0	16	0	16
<i>Tetramorium smithi</i> (Myar, 1879)	0	1	4	5
* <i>Tetramorium tonganum</i> Mayr, 1870	1	11	4	16
<i>Tetramorium triangulatum</i> Bharti & Kumar, 2012	0	9	8	17
<i>Tetramorium walshi</i> (Forel, 1890)	0	12	7	19
<i>Camponotus compressus</i> (Fabricius, 1787)	12	20	14	46
<i>Camponotus himalayanus</i> Forel, 1893	0	6	0	6
<i>Camponotus horseshoetus</i> Datta&Raychaudhuri, 1985	0	0	5	5
<i>Camponotus kattensis</i> Bingham, 1903	2	1	0	3
<i>Camponotus lamarckii</i> Forel, 1892	3	12	3	18
<i>Camponotus mitis</i> (Smith,F. 1858)	13	18	12	43
<i>Camponotus nirvanae</i> Forel, 1893	7	13	11	31
<i>Camponotus oblongus binominatus</i> Forel, 1916	7	12	11	30
<i>Camponotus opaciventris</i> Mayr, 1879	2	11	12	25
# <i>Camponotus parabarbatus</i> Bharti & Wachkoo, 2014	5	5	0	10
<i>Camponotus parius</i> Emery, 1889	20	15	15	50
<i>Camponotus sylvaticus basalis</i> Smith,F. 1878	7	10	4	21
<i>Camponotus wasmanni</i> Emery, 1893	13	16	11	40
<i>Polyrhachis exercita lucidiventris</i> Forel, 1907	0	0	4	4
<i>Polyrhachis exercita obtusisquama</i> Forel, 1902	0	0	11	11
<i>Polyrhachis illaudata</i> Walker, 1859	17	5	0	22
<i>Polyrhachis lacteipennis</i> Smith,F. 1858	4	16	7	27
# <i>Polyrhachis menelas</i> Forel, 1904	12	16	14	42

<i>Polyrhachis punctillata fergusonii</i> Forel, 1902	0	0	2	2
<i>Polyrhachis punctillata smythiesii</i> Forel, 1895	0	5	4	9
<i>Polyrhachis tibialis</i> Emery, 1900	13	0	0	13
<i>Cataglyphis longipedem</i> (Eichwald, 1841)	2	12	13	27
<i>Messor himalayanus</i> (Forel, 1902)	0	19	4	23
<i>Messor instabilis</i> (Smith, 1858)	6	25	8	39
<i>Acropyga acutiventris</i> Roger, 1862	2	0	0	2
<i>Brachyponera jerdonii</i> (Forel, 1900)	14	10	7	31
<i>Brachyponera luteipes</i> (Mayr, 1862)	25	21	22	68
<i>Cataulacus latus</i> Forel, 1891	7	0	0	7
<i>Cataulacus taprobanae</i> Smith, 1853	6	17	6	29
<i>Chronoxenus wroughtonii</i> (Forel, 1895)	13	17	11	41
# <i>Dilobocondyla gasteroreticulatus</i> Bharti & Kumar, 2013	5	0	2	7
<i>Dolichoderus taprobanae</i> (Smith, 1858)	15	19	4	38
<i>Gauromyrmex acanthinus</i> (Karavaiev, 1935)	0	4	0	4
<i>Meranoplus bicolor</i> (Guérin-Méneville, 1844)	8	23	12	43
<i>Oecophylla smaragdina</i> (Fabricius, 1775)	15	11	11	37
# <i>Prenolepis fisheri</i> Bharti&Wachkoo, 2012	1	0	0	1
<i>Prenolepis naoroji</i> Forel, 1902	15	20	4	39
* <i>Solenopsis geminata</i> (Fabricius, 1804)	0	1	0	1
<i>Tetraponera allaborans</i> (Walker, 1859)	5	9	5	19
<i>Tetraponera nigra</i> (Jerdon, 1851)	4	15	8	27
<i>Tetraponera rufonigra</i> (Jerdon, 1851)	4	11	9	24
# <i>Vollenhovia gasteropunctata</i> Bharti & Kumar, 2013	0	2	0	2
° <i>Carebara affinis</i> (Jordan, 1851)	14	7	5	26
# <i>Carebara carinata</i> Bharti & Kumar, 2013	0	3	0	3
# <i>Carebara dentata</i> Bharti & Kumar, 2013	6	10	3	19
° <i>Carebara diversus</i> (Jordan, 1851)	4	2	0	6
# <i>Carebara hornata</i> Bharti & Kumar, 2013	0	10	0	10
# <i>Carebara propomegata</i> Bharti & Kumar, 2013	0	8	4	12
# <i>Carebara rectangulata</i> Bharti & Kumar, 2013	0	9	0	9
<i>Carebara spinata</i> Bharti & Kumar, 2013	4	15	0	19
# <i>Cryptopone subterranea</i> Bharti & Kumar, 2013	0	2	0	2

<i>Dorylus labiatus</i> Shuckard, 1840	0	11	8	19
<i>Dorylus orientalis</i> Westwood, 1835	19	18	15	52
<i>Hypoponera confinis wroughtonii</i> (Forel, 1900)	18	18	10	46
<i>Hypoponera assmuthi</i> (Forel, 1905)	0	1	0	1
* <i>Hypoponera confinis</i> (Roger, 1860)	19	15	2	36
* <i>Hypoponera ragusai</i> (Emery, 1894)	3	13	8	24
# <i>Leptanilla lamellata</i> Bharti & Kumar, 2012	0	6	0	6
<i>Lophomyrmex ambiguus</i> Rigato, 1994	4	0	0	4
<i>Lophomyrmex bedoti</i> Emery, 1893	20	17	5	42
<i>Lophomyrmex quadrispinosus</i> (Jerdon, 1851)	2	20	5	27
# <i>Lophomyrmex terraceensis</i> Bharti & Kumar, 2012	1	0	0	1
<i>Mayriella transfuga</i> Baroni Urbani, 1977	8	23	8	39
# <i>Myopias shivalikensis</i> Bharti & Wachkoo, 2012	0	1	0	1
<i>Mystrium camillae</i> Emery, 1889	3	0	0	3
<i>Plagiolepis dichroa</i> Forel, 1902	0	2	1	3
<i>Plagiolepis jerdonii</i> Forel, 1894	23	19	15	57
# <i>Ponera indica</i> Bharti & Wachkoo, 2012	6	2	0	8
<i>Ponera taylori</i> Bharti & Wachkoo, 2012	0	8	1	9
<i>Prionopelta kraepelini</i> Forel, 1905	0	8	0	8
<i>Proceratium williamsi</i> Tiwari, 2000	4	4	0	8
# <i>Pseudolasius</i> sp.1	0	1	0	1
# <i>Pseudolasius</i> sp.2	16	0	0	16
<i>Pseudoponera darwinii</i> (Forel, 1893)	0	0	2	2
<i>Pyramica membranifera</i> (Emery, 1869)	7	4	0	11
<i>Pyramica nepalensis</i> (De Andrade, 1994)	8	5	3	16
<i>Recurvidris recurvispinosa</i> (Forel, 1890)	8	13	6	27
# <i>Stigmatomma boltoni</i> (Bharti & Wachkoo, 2011)	1	2	4	7
<i>Strumigenys exilirhina</i> Bolton, 2000	2	0	0	2
<i>Strumigenys virgila</i> Bolton, 2000	0	12	0	12
<i>Aenictus aitkenii</i> Forel, 1901	0	15	0	15
<i>Aenictus brevicornis</i> (Mayr, 1879)	0	0	8	8
<i>Aenictus ceylonicus</i> (Mayr, 1866)	16	18	0	34
# <i>Aenictus doryloides</i> Wilson, 1964	14	12	0	26

<i>Aenictus pachycerus</i> (Smith,F. 1858)	0	0	11	11
<i>Aenictus peguensis</i> Emery, 1895	0	13	11	24
# <i>Aenictus sagei</i> Forel, 1901	0	13	19	32
# <i>Aenictus wilsoni</i> Bharti et al. 2012	0	14	0	14
# <i>Anochetus cryptus</i> Bharti & Wachkoo, 2013	0	7	2	9
<i>Anochetus graeffei</i> Mayr, 1870	11	11	14	36
<i>Anochetus madaraszi</i> Mayr, 1897	0	1	0	1
<i>Anochetus myops</i> Emery, 1893	16	6	0	22
<i>Anochetus sedilloti</i> Emery, 1884	0	7	0	7
# <i>Anochetus validus</i> Bharti & Wachkoo, 2013	0	11	1	12
<i>Bothroponera tesseronoda</i> (Emery, 1877)	6	14	0	20
<i>Buniapone amblyops</i> (Emery, 1887)	0	1	0	1
* <i>Cerapachys biroi</i> Forel, 1907	14	15	4	33
# <i>Cerapachys browni</i> Bharti & Wachkoo, 2013	1	0	0	1
# <i>Cerapachys costatus</i> Bharti & Wachkoo, 2013	1	0	0	1
<i>Cerapachys longitarsus</i> (Mayr, 1879)	6	1	1	8
# <i>Ectomomyrmex striolatus</i> (Donisthorpe, 1933)	16	15	0	31
<i>Harpegnathos venator</i> (Smith,F. 1858)	3	5	6	14
<i>Leptogenys chinensis</i> (Mayr, 1870)	0	11	8	19
<i>Leptogenys diminuta laeviceps</i> (Smith,F. 1857)	18	19	14	51
<i>Leptogenys hysterica</i> Forel, 1900	1	1	0	2
# <i>Leptogenys lattkei</i> Bharti & Wachkoo, 2013	0	3	0	3
<i>Leptogenys lucidula</i> Emery, 1895	12	0	0	12
# <i>Leptogenys transtionis</i> Bharti & Wachkoo, 2013	0	1	0	1
<i>Odontomachus monticola</i> Emery, 1892	0	1	0	1
<i>Platythyrea parallela</i> (Smith,F. 1859)	7	7	1	15
<i>Platythyrea sagei</i> Forel, 1900	0	7	0	7
<i>Pseudoneoponera bispinosa</i> (Smith,F.1858)	17	3	4	24
<i>Pseudoneoponera rufipes</i> (Jerdon,1851)	12	21	14	47
Total species incidences	1024	1555	833	3412