

## Butterflies of Gulbarga District, Deccan Plateau, Hyderabad Karnataka

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Gulbarga District lies in northernmost Karnataka State, in southern India, immediately south of Bidar District. Recently its southern half or so has been designated a separate Yadgir District for administrative reasons, but it is treated here as the old, more inclusive political unit. It lies bang in the centre of the Deccan Plateau, a singular endemic region of the Indian sub-continent. Having once constituted a segment of the ancient prehistoric continent of Gondwanaland, this land is the oldest and most stable in India. The plateau is mainly between 1,000 and 2,500 ft (300 to 750 m) above sea level, and its general slope descends toward the east. A number of hill ranges of the Deccan were eroded and rejuvenated several times, and only their current remaining summits testify to their geological history. The main peninsular block is composed of gneiss, granite-gneiss, schists, and granites, as well as of more geologically recent basaltic lava flows. Telangana State covers the east-central region of this Plateau, and Karnataka the west central and most of the southern areas of the Deccan Plateau, with its extreme southeastern portion lying in Tamil Nadu.

The only paper I found on butterflies of this district was by Ankalgi & Jadesh (2014), documenting the Rhopalocera faunistics of the small Ankalga village which is "located... near Kurikotta Bridge (longitude 76.921163 and latitude 17.491258) of Gulbarga district" which is about 25 km NE. of Gulbarga. This village receives the backwaters of Bennathora reservoir. The temperatures there range from 16°C to 45°C and average annual rainfall is about 750mm. I have noted which species they listed and have made corrections and updates as necessary in the list below. Ankalgi & Jadesh (2014) stated that their specimens were identified by Dr C.A. Viraktamath and his team at the Agricultural College, University of Agricultural Sciences, Bangalore. I was also shown a set of large specimen boxes with butterflies sampled by Dr Shankara Murthy and his team, Department of Entomology, Agricultural College, Bheemarayanagudi, Yadgir District, which data has also been incorporated. I was also shown butterflies collected by students of KVK, Agricultural College and Research Station, on Aland Road, Gulbarga, through Dr Suhas Yelshetty, which data is also incorporated in the list below.

In this paper, 'old species' names are placed in roman italics (in parentheses), for recognition (see Tiple & Ghorpadé, 2012, for more details). The list is in alphabetical order of genera and species for convenience of reference, but families are included in currently understood phylogenetic order, from basal to derived.

Acronyms used are for species citations in the following reference books or papers : IK = Kehimkar (2008), WB = Wynter-Blyth (1957), HE = Evans (1932), besides TL = Larsen (1987-1988) and HG = Gaonkar (1996), by page or serial numbers.

### Family HESPERIIDAE

One species, undetermined, viz., Ankalgi & Jadesh (2014 : 1168).

### Family PAPILIONIDAE

1. *Graphium (doson) eleius* Frühstorfer : Dravidian Jay — IK 120, 147, WB 402, HE 55, FBI 66b, TL 16, HG 6.

2. *Graphium (agamen:non) menides* Frühstorfer : Tailed Jay — IK 120, 148, WB 404, HE 56, TL 17, HG 7.

3. *Pachliopta aristolochiae* Fabricius : Whitespotted Rose — IK 141, 157, WB 375, HE 44, TL 3, HG 3. Ankalgi & Jadesh (2014), as "*Atrophaneura aristolochiae*".

4. *Pachliopta hector* Linnaeus : Crimson Rose — IK 142, 157, WB 375, HE 44, TL 4, HG 4. Ankalgi & Jadesh (2014), as "*Atrophaneura hector*".

5. *Papilio demoleus* Linnaeus : Lime Swallowtail — IK 133, 154, WB 395, HE 52, TL 6, HG 11. Ankalgi & Jadesh (2014).

6. *Papilio (polytes) romulus* Cramer : Black Mormon — IK 127, 150, WB 392, HE 52, TL 10, HG 15. Ankalgi & Jadesh (2014), as "*Papilio polytes*".

### Family PIERIDAE

1. *Appias libythea* Fabricius : Striped Albatross — IK 174, 193, WB 427, HE 73, TL 28, HG 37.

2. *Belenois aurota* Fabricius : Pioneer — IK 188, 198, WB 425, HE 71, TL 26, HG 35. Ankalgi & Jadesh (2014).

3. *Catopsilia pomona* Fabricius : Lemon Emigrant — IK 164, 190, WB 446, HE 75, TL 42, HG 20. Ankalgi &

Jadesh (2014).

4. *Catopsilia pyranthe* Linnaeus : Mottled Emigrant — IK 164, 190, WB 447, HE 75, TL 43, HG 21. Ankalgi & Jadesh (2014).

5. *Cepora (nerissa) phryne* Fabricius : Field Gull — K 182, 195, WB 421, HE 72, TL 24, HG 33. Ankalgi & Jadesh (2014), as "*Cepora nerissa*".

6. *Colotis danae* Fabricius : Southern Crimson Tip — IK 169, 191, WB 441, HE 83, TL 35, HG 44. Ankalgi & Jadesh (2014).

7. *Colotis etrida* Boisduval : Small Orange Tip — IK 169, 191, WB 440, HE 83, TL 33, HG 42.

8. *Colotis eucharis* Fabricius : Plain Orange Tip — IK 170, 191, WB 441, HE 83, TL 34, HG 43.

9. *Colotis (fausta) fulvia* Wallace : Large Salmon Arab — IK 170, 191, WB 440, HE 83, TL 36, HG 45.

10. *Delias eucharis* Drury : Indian Jezebel — IK 187, 198, WB 420, HE 69, TL 20, HG 29. Ankalgi & Jadesh (2014).

11. *Eurema (andersoni) ormistoni* Watkins : One-Spot Grass Yellow — Ankalgi & Jadesh (2014), as "*Eurema andersoni*"; IK (160), WB 454, HE 78, TL 48, HG 27. Taxonomy unresolved.

12. *Eurema (brigitta) rubella* Wallace : Red-Line Grass Yellow — IK 161, 189, WB 450, HE 77, TL 44, HG 22. Ankalgi & Jadesh (2014), as "*Eurema brigitta*".

13. *Eurema hecabe* Linnaeus : Two-Spot Grass Yellow — IK 161, 189, WB 453, HE 78, TL 46, HG 24.

14. *Eurema (blanda) silhetana* Wallace : Three-Spot Grass Yellow — IK 160, 189, WB 453, HE 78, TL 47, HG 25.

15. *Ixias marianne* Cramer : White Orange Tip — IK 171, 192, WB 436, HE 81, TL 37, HG 48. Ankalgi & Jadesh (2014), as "*Ixias marianne*".

16. *Ixias (pyrene) sesia* Fabricius : Yellow Orange Tip — IK 172, 192, WB 437, HE 81, TL 38, HG 49.

17. *Parerionia hippia* Fabricius : Indian Wanderer — IK 174, 192, WB 444, HE 84, TL 40, HG 50.

18. *Pieris (canidia) canis* Evans : Indian Cabbage White — IK 179, 194, WB 433, HE 67, TL 23, HG 32.

#### Family LYCAENIDAE

1. *Caleta decidia* Hewitson : Angled Pierrot — Ankalgi & Jadesh (2014); IK 250, 291, WB 259, HE 214, TL 52, HG 153 [Ankalgi & Jadesh (2014: 1168) placed this, probably inadvertently, as a Nymphalidae (!) and as "*C. caleta* Hewitson" which is extralimital].

2. *Castalius rosimon* Fabricius : Woodland Pierrot — Ankalgi & Jadesh (2014); IK 251, 291, WB 259, HE 214, TL 51, HG 152.

3. *Catochrysops strabo* Fabricius : Blue Forget-Me-Not — Ankalgi & Jadesh (2014); IK 259, WB 289, HE 236, TL 77, HG 182.

4. *Euchrysops cnejus* Fabricius : Gram Blue — IK 268, WB 287, HE 234, TL 76, HG 181.

5. *Freyeria putli* Kollar : Tiny Grass Jewel — D 23, C 131, T 102; IK 262, WB 284, HE 233, TL 75, HG 180.

6. *Lampides boeticus* Linnaeus : Pea Blue — IK 260, WB 289, HE 236, TL 78, HG 184.

7. *Leptotes plinius* Fabricius : Zebra Blue — Ankalgi & Jadesh (2014); IK 252, 292, WB 266, HE 217, TL 57, HG 160.

8. *Prosotas (dubiosa) indica* Evans : Tail-Less Lineblue — Ankalgi & Jadesh (2014), as "*Prosotas dubiosa*"; IK 256, 293, WB 298, HE 243, TL 90, HG 196.

9. *Tarucus indica* Evans : Pointed Pierrot — IK 261, 294, WB 264, HE 216, HG 159.

10. *Tarucus nara* Kollar : Striped Pierrot — IK 260, 293, WB 264, HE 216, TL 55, HG 156.

11. *Zizina (otis) indica* Murray : Lesser Grass Blue — Ankalgi & Jadesh (2014), as "*Zizina otis*"; IK 263, WB 285, HE 234, TL 70, HG 175.

#### Family NYMPHALIDAE

1. *Acraea violae* Fabricius : Tawny Coster — IK 355, WB 235, HE 192, TL 227, HG 88. Ankalgi & Jadesh (2014).

2. *Ariadne (ariadne) indica* Linnaeus : Angled Plains Castor — IK 393, WB 231, HE 191, TL 178, HG 120.

3. *Byblia ilithyia* Drury : Joker — IK 394, WB 231, HE 190, TL 177, HG 119. Ankalgi & Jadesh (2014).

4. *Charaxes solon* Fabricius : Black Rajah — IK 314, WB 146, HE 142, TL 226, HG (87).

5. *Danaus chrysippus* Linnaeus : Plain Tiger — IK 302, 413, WB 69, HE 88, TL 149, HG 143. Ankalgi & Jadesh (2014).

6. *Danaus genutia* Cramer : Striped Tiger — IK 301, 413, WB 69, HE 88, TL 142, HG 144.

7. *Euploea core* Cramer : Indian Black Crow — IK 308, WB 72, HE 90, TL 148, HG 145. Ankalgi & Jadesh (2014).

8. *Hypolimnas bolina* Linnaeus : Great Eggfly — IK 409, WB 201, HE 174, TL 196, HG 134. Ankalgi & Jadesh (2014).

9. *Hypolimnas misippus* Linnaeus : Danaid Eggfly — IK 410, WB 202, HE 173, TL 195, HG 135. Ankalgi & Jadesh (2014).

10. *Junonia almana* Linnaeus : Peacock Pansy — IK 408, 444, WB 207, HE 176, TL 189, HG 128.

11. *Junonia hierta* Fabricius : Yellow Pansy — IK

407, 444, WB 206, HE 176, TL 186, HG 125.

12. *Junonia lemonias* Linnaeus : Lemon Pansy — IK 409, WB 207, HE 176, TL 188, HG 127. Ankalgi & Jadesh (2014).

13. *Junonia (orithya) swinhoi* Butler : Blue Pansy — IK 407, WB 206, HE 176, TL 187, HG 126. Ankalgi & Jadesh (2014), as "*Junonia orithya*."

14. *Melanitis leda* Linnaeus : Familiar Evening Brown — IK 322, 421, WB 122, HE 125, FBI 405, TL 151, HG 55. Ankalgi & Jadesh (2014).

15. *Phalanta phalantha* Drury : Large Leopard — IK 364, 433, WB 224, HE 187, TL 181, HG 92.

16. *Tirumala (limniace) leopardus* Butler : Pale Blue Tiger — IK 300, WB 67, HE 87, TL 143, HG 141.

17. *Ypthima (asterope) mahratta* Moore : Regular Three-Ring — IK 351, 430, WB 115, HE 120, TL 170, HG 75.

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### Life Began on Land, Not Sea Darwin was Right

Charles Darwin had suggested that life on Earth originated on land in a 'warm little pond' and not in the oceans. Now, a new study has claimed the theory proposed by the legendary naturalist more than 150 years ago could actually be right.

The study by researchers at the Osnabruck University in Germany found that the first primitive cells could have germinated in pools of condensed vapour caused by underground hot water or steam bubbling on the surface of the planet. The findings, published in the journal *Proceedings of the National Academy of Sciences*, challenging the wide spread view that life originated in the sea, the *Daily Mail* reported.

For their study, the researchers analysed evidence of key rock chemicals in ancient inland and marine habitats and then compared them with a genetic reconstruction of Earth's first cells. They found that the oceans did not contain the best balance of the ingredients to foster life.

Instead the simplest cells assembled in inland hatcheries where—like the hot springs—volcanic processes actively vented vapour from the planet's interior, the scientists said. The chemical composition of these emissions most closely matches the inorganic chemistry of the cells.

These "cradles of life" share all of the advantages of the deep sea hydrothermal vents that have been previously proposed in the same capacity including the presence of organic matter, they said.