

DISTRIBUTION AND HOSTS OF FIVE *PHILOTES* IN
CALIFORNIA (LYCAENIDAE)

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In central coastal California, five entities of *Philotes* are known to occur: *Philotes battoides bernardino*, *P. enoptes bayensis*, *P. enoptes smithi*, *P. enoptes tildeni*, and *P. sonorensis* (Langston, 1964).

The detailed area of this study encompasses the region in northern and central California from Humboldt County to San Luis Obispo County on the coast, and inland to the Sacramento and San Joaquin valleys. This area includes both the immediate coastal ranges (North Coast Range, Santa Cruz Mountains, and the Santa Lucia Range), and the inner coast ranges (Mt. Hamilton and Diablo Ranges south to the Tehachapi Mountains).

Two of these *Philotes* (*bernardino* and *sonorensis*) occur to the east and are much more widespread to the south of the above-defined central coastal area. Confirmed records of these localities are indicated on the state maps (Figs. 1 and 3). However, for brevity, this additional distribution is cited by county only.

Host plant associations are included under each *Philotes* along with the distributional records. The data given in detail (locality, date, numbers, and collector) are those that have come to my attention from several lepidopterists since an earlier paper (Langston, 1964) was submitted for publication. Also included are 1963 and 1964 data accumulated subsequent to this paper. Previously published data (Mattoni, 1954; Langston, 1964) are given by locality only, but are repeated here to denote the remaining symbols on the central coastal map (Fig. 2).

In an attempt to more easily picture the distributional patterns, the counties are listed from north to south, rather than alphabetically. The localities within each county are also listed from north to south, in combination with west to east, insofar as possible.

PHILOTES BATTOIDES BERNARDINO Barnes & McDunnough

Philotes battoides bernardino Barnes & McDunnough, 1916, Contr. Nat. Hist. Lepid. N.A., 3(2): 116.

The San Bernardino blue is a late spring and early summer flier. Within the counties where detailed records are given below, it has been associated with *Eriogonum fasciculatum foliolosum* (Nuttall) S. Stokes.

In southern California it has also been found, in most instances, on *E. f. foliolosum*. In addition it has been taken on *E. fasciculatum fascicu-*

latum Bentham along the immediate coast of southern California. In the desert and east slope areas it was found on *E. fasciculatum polifolium* (Bentham) S. Stokes and *E. fasciculatum flavoviride* (Munz & Johnston) S. Stokes.

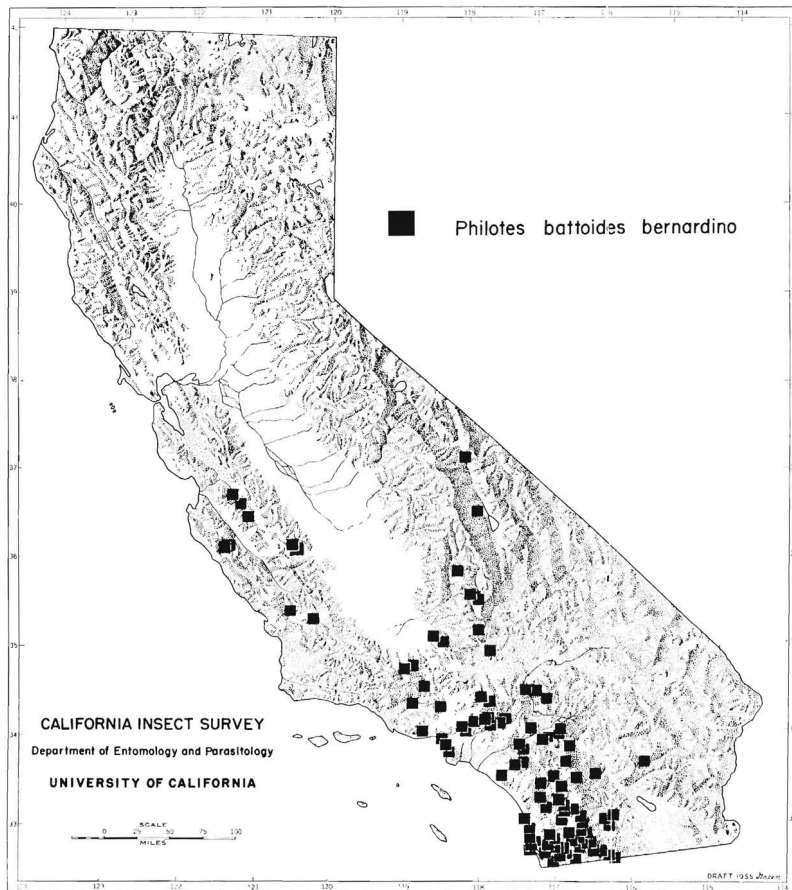
CENTRAL COASTAL RECORDS:

San Benito Co.: Tres Pinos, 3 mi. S, VI-15-1963, 4 ♂♂, 2 ♀♀; Paicines, 12 mi. S, VI-15-1963, 3 ♂♂, 4 ♀♀; Pinnacles Nat. Mon., 4 mi. E, VI-15-1963, 5 ♂♂, 7 ♀♀ (all R. L. Langston).

Monterey Co.: Arroyo Seco; Arroyo Seco, 4 mi. E.

Fresno Co.: Coalinga, 10 & 16 mi. NW, VI-7-1957, 2 ♂♂ (O. E. Sette).

San Luis Obispo Co.: Creston, 3 mi. S, V-4-1962, 1 ♀ (R. W. Thorp); Simmler, 13 mi. WNW, VI-7-1957, 1 ♂ (O. E. Sette).



EXPLANATION OF MAP 1

Geographic distribution of *Philotes battoides bernardino* Barnes & McDunnough in California.

Kern Co. (western part only): Frazier Park, VII-20-1963, 1 ♀ (J. A. Powell); Lebec, VI-9-1957, 2 ♂♂ (P. A. Opler); Tehachapi, 5 & 6 mi. NW, VI-14-1957, 6 ♂♂ (O. E. Sette); near Woodford (Keene P. O.), VI-26-1955, 1 ♂, 2 ♀♀ (J. A. Powell).

California county records (see map 1):

Inyo, Tulare, Kern, Ventura, Los Angeles, San Bernardino, Riverside, Orange, San Diego.

Baja California Norte:

South to Cedros Island (Rindge, 1948); Sierra San Pedro Martir (Patterson & Powell, 1960).

PHILOTES ENOPTES BAYENSIS Langston

Philotes enoptes bayensis Langston, 1964, Jour. Lepid. Soc., 17: 208 ("1963").

This blue is a late spring and early summer flier. In Contra Costa and Solano counties oviposition and larval feeding are known to occur upon *Eriogonum latifolium auriculatum* (Bentham) S. Stokes. In Marin and Sonoma counties it is associated with *Eriogonum latifolium nudum* (Douglas ex Bentham) S. Stokes. In these counties *auriculatum* and *nudum* are both white-flowered varieties, and tend to hybridize, so that in certain areas (particularly Marin County) the two are almost inseparable. Within the area studied, these plants come into bloom in mid-May and extend into July, with early or "fresh" blossoms in evidence during the flight of *P. enoptes bayensis*.

The discovery of some papered specimens collected in 1907 that had been stored in the basement at the California Academy of Sciences, extended the range of this insect to the north—into Humboldt and Mendocino counties. These two counties are not shown on the central coastal map (Fig. 2), but the localities as noted by the collector are given below. Additional data is given in parenthesis to indicate the areas in relation to places that appear on most state maps.

The complete known distribution is as follows:

Humboldt Co.: Fruitland (near Eel River, SE of McCann), VI-15-1907, 1 ♂, 2 ♀♀, VI-17-1907, 8 ♂♂, 14 ♀♀ (John Strohbeen).

Mendocino Co.: Blue Rock (Creek 2 mi. S of Bell Springs), VI-18-1907, 1 ♂ (John Strohbeen).

Sonoma Co.: Duncan Mills, 2 mi. E to 3 mi. NE, VII-9-1961, 3 ♂♂, 1 ♀, VII-6-1962, 6 ♂♂, 3 ♀♀, VI-29-1963, 1 ♀, VI-30-1963, 6 ♂♂, 2 ♀♀ (N. L. LaDue), VII-5-1964, 3 ♂♂, 1 ♀ (R. L. Langston); Duncan Mills, 2 mi. W, VII-5-1964, 4 ♂♂, 1 ♀; Occidental, 2 mi. W, VII-4-1964, 3 ♂♂, 12 ♀♀; Forestville, 3 mi. W, VII-4-1964, 7 ♂♂, 5 ♀♀; Graton, 3 mi. W, VII-4-1964, 2 ♂♂, 2 ♀♀ (all R. L. Langston).

Marin Co.: China Camp, near Point San Pedro, V-30-1961, 2 ♂♂ (N. L. LaDue); Paradise Cay, 3 mi. SE of Corte Madera, V-30-1961, 27 ♂♂ & ♀♀, V-22-1962, 4 ♂♂, 2 ♀♀, V-29-1962, 37 ♂♂ & ♀♀ (N. L. LaDue); Tiburon, 2 mi. NE; hill above Tiburon, V-23-1964, 2 ♂♂, 1 ♀ (R. L. Langston).

Solano Co.: Carquinez Strait at Glen Cove.

Contra Costa Co.: Point San Pablo, Richmond, VI-12-1964, 7 ♂♂, 3 ♀♀ (R. L. Langston); Point Richmond, V-30-1963, 13 ♂♂, 5 ♀♀, VI-1-1963, 24 ♂♂, 9 ♀♀, V-17-1964, 17 ♂♂, 9 ♀♀, V-27-1964, 18 ♂♂, 9 ♀♀, VI-6-1964, 10 ♂♂, 6 ♀♀, VI-12-1964, 17 ♂♂, 16 ♀♀ (all R. L. Langston).

PHILOTES ENOPTES SMITHI Mattoni

Philotes enoptes smithi Mattoni, 1954, Bull. So. Calif. Acad. Sci., 53: 160.

This blue is a late summer flier, and has been associated with *Eriogonum parvifolium* Smith.

Surveys were made in 1962 and 1963 between the northern and southern records indicated. Although the foodplant was found in abundance along the immediate coast (particularly near Point Lobos and to the north of Big Sur), no additional colonies of *P. enoptes smithi* were found. Attempts were previously made to discover the race both to the north and south of the open circles on the map (Fig. 2), as noted by Langston (1964). The localities below have been published (Mattoni, 1955; Langston, 1964), and are not given in further detail.

The complete known distribution is as follows:

Monterey Co.: Marina Beach, dunes; Seaside, dunes, VIII-19-1963, 2 ♂♂, 3 ♀♀ (R. L. Langston), VII-26-1964, 8 ♂♂, 3 ♀♀ (P. A. Opler); Monterey, "sand hills"; Paraiso Springs; Burns Creek, State Hwy. 1 (Type locality); Dolan Creek, State Hwy. 1; Lucia, 3 & 4 mi. SE, VIII-6-1956, 6 ♂♂, 4 ♀♀ (O. E. Sette); Corda, 4 mi. N.

PHILOTES ENOPTES TILDENI Langston

Philotes enoptes tildeni Langston, 1964, Jour. Lepid. Soc., 17: 212 ("1963").

This blue is a late summer flier, and has been taken in association with yellow-flowered varieties of *Eriogonum latifolium* Smith. The plant subspecies varied with localities, and is cited with the detailed records below. All of these plants come into bloom in August and extend until October, with early or "fresh" blossoms in evidence during the flight of *P. enoptes tildeni*.

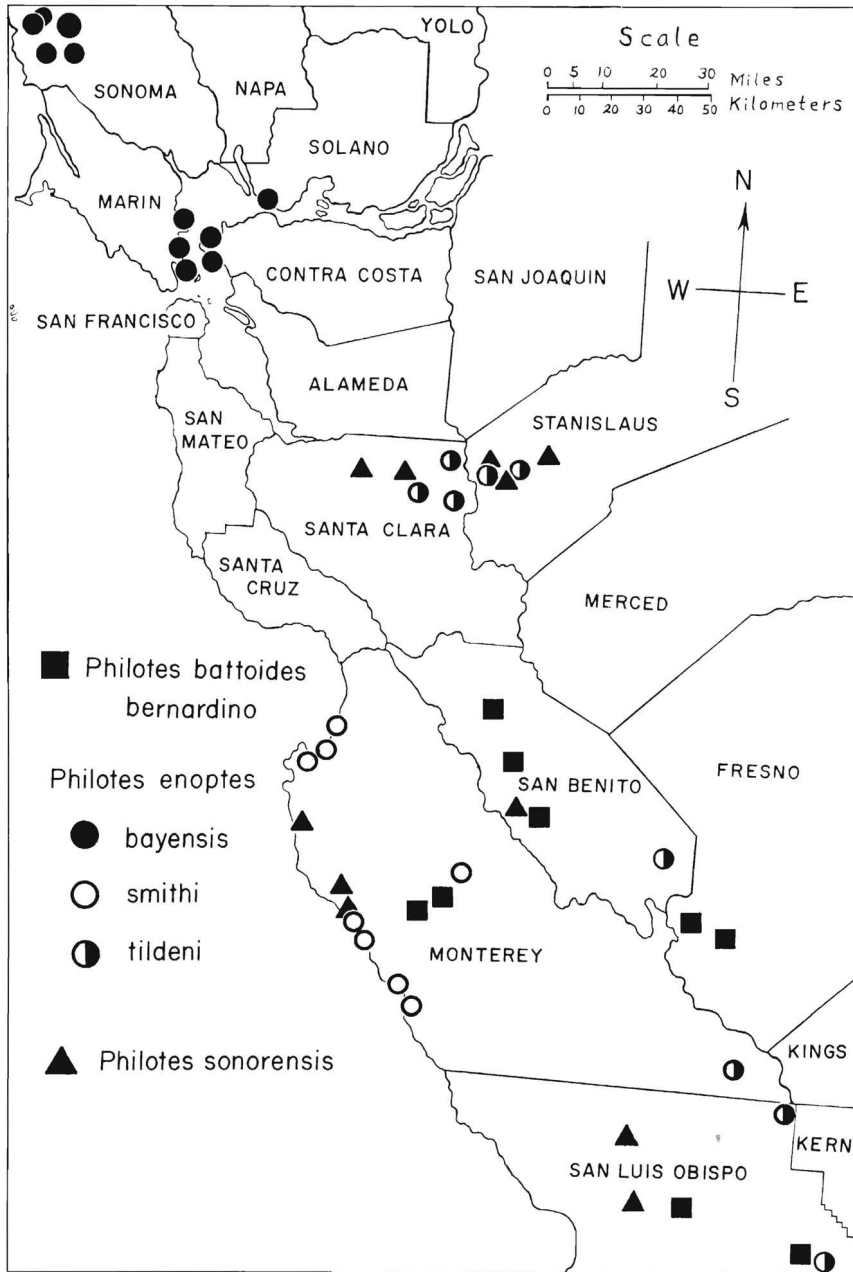
Additional surveys extended the range of this insect considerably, into San Benito, Monterey, and San Luis Obispo counties. Colonies could occur all along the Diablo Range between these new records and the northern locales. Much of the range is rather inaccessible, with the greater part of the existing roads following the valleys.

The complete known distribution and associated plants are as follows:

Santa Clara Co.: Arroyo Bayo, E base of Mt. Hamilton; San Antonio Valley, E & NE of Mt. Hamilton [*Eriogonum latifolium nudum* (Douglas ex Bentham) S. Stokes].

Stanislaus Co.: Del Puerto Canyon, 22 mi. W of Patterson, IX-11-1963, 12 ♂♂, 2 ♀♀ (R. L. Langston & J. A. Powell); 18 mi. W of Patterson [*E. latifolium auriculatum* (Bentham) S. Stokes].

San Benito Co.: Call Mts. above New Idria, VIII-27-1964, 4 ♀♀ (Langston, Powell & P. A. Opler) (*E. latifolium auriculatum*).



EXPLANATION OF MAP 2

Geographic distribution of *Philotes* in central coastal California.

Monterey Co.: Parkfield, 3 mi. SE, VIII-23-1963, 1 ♀ (Powell) [*E. latifolium saxicola* (Heller) S. Stokes].

San Luis Obispo Co.: Cottonwood Pass, 6 mi. NE of Cholame, VIII-23-1963, 1 ♂ (Powell), VIII-26-1963, 5 ♂♂, 1 ♀ (Powell & O. E. Sette), IX-20-1963, 1 ♀ (Sette), IX-11-1964, 3 ♂♂, 2 ♀♀ (Langston & Powell) (*E. latifolium indictum* Jepson); Simmler, 8 mi. W, IX-11-1964, 4 ♂♂, 4 ♀♀ (Langston, Powell & A. J. Slater) (*E. latifolium saxicola*).

PHILOTES SONORENSIS (Felder & Felder)

Lycaena sonorensis Felder & Felder, 1865, Reise Freg. Novara, Lepid. 2(2): 281.

The Sonora blue is an early to late spring flier. Adults have been taken from early February to May depending on elevation, and exposure of the rocky areas upon which the foodplant occurs. Latitude appears to have little effect, as the adult flight in many seasons is as early in northern as in southern California.

The larvae are known to feed on various members of the stonecrop family (Comstock, 1927; Comstock and Coolidge, 1930). In southern California *P. sonorensis* has been associated with stonecrops with erect, terete leaves (*Stylophyllum*), and others having angular fleshy rosettes (*Sedum* and *Dudleya*). However, recent classifications place all of the California *Stylophyllum* and many species of *Sedum* in the genus *Dudleya*. In the central coastal area, *Philotes sonorensis* has been found to be associated exclusively with *Dudleya cymosa setchellii* (Jepson) Moran.¹ Exact host determinations would be necessary to know whether this blue feeds on anything other than *Dudleya* under present taxonomic concepts.

Central coastal records:

Santa Clara Co.: Alum Rock Park, II-21-1954, 1 ♂, III-11-1956, 2 ♂♂, 2 ♀♀, II-22-1964, 7 ♂♂, 1 ♀, III-7-1964, 1 ♂, II-11, 13-1965, 2 ♂♂ (P. A. Opler), III-21-1957, 3 ♀♀, IV-2-1960, 1 ♂ (O. E. Sette), II-12-1964, 12 ♂♂, 5 ♀♀ (R. L. Langston), II-14-1965, 4 ♂♂, II-19-1965, 10 ♂♂, 4 ♀♀ (A. J. Slater); Arroyo Del Valle, E base of Mt. Hamilton.

Stanislaus Co.: Adobe Creek; Del Puerto Canyon, 22 mi. W of Patterson, III-5-1963, 1 ♀, IV-30-1963, 1 ♂, II-22-1964, 2 ♂♂ (Langston); 21 mi. W of Patterson, II-22-1964, 3 ♂♂, 5 ♀♀ (Langston).

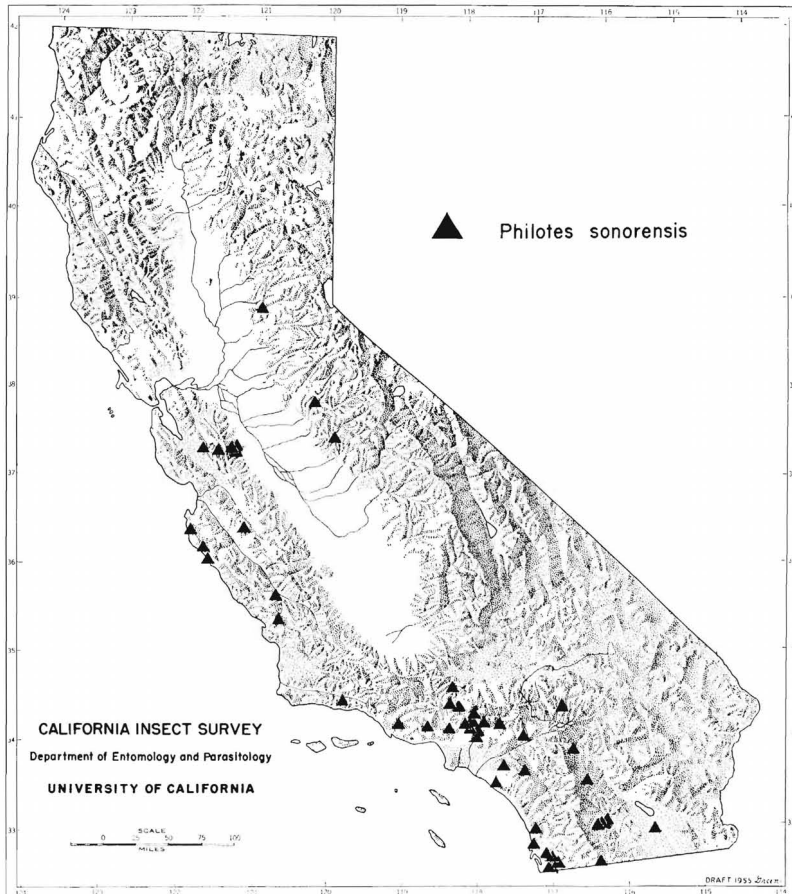
San Benito Co.: Pinnacles Natl. Mon., north road, III-31-1962, 1 ♂ (D. C. Rentz).

Monterey Co.: Carmel, 10 mi. S, IV-14-1963, 1 ♂ (D. W. Conard); Big Sur, V-4-1952, 2 ♀♀ (T. W. Davies); Partington Canyon, 9 mi. S of Big Sur, IV-21-1956, 5 ♂♂ (P. A. Opler), V-11-1964, 2 ♂♂ (R. M. Brown).

San Luis Obispo Co.: Paso Robles, III-10-1894, 1 ♂ (W. G. Wright); Atascadero, III-6, 7, 8-1932, 7 ♂♂, III-13, 16-1932, 4 ♂♂, IV-4-1932, 1 ♂, III-14, 26-1935, 2 ♂♂, IV-5-1935, 1 ♂, 1 ♀ (V. L. Clemence).

California county records (see map 3):

¹ During recent collecting in Placer county (N. Fork, American River E. of Auburn, III-23-1965, Langston), two females were taken resting on *Dudleya cymosa cymosa* (Lemaire) Britton & Rose (det. by Reid V. Moran, San Diego Nat. Hist. Mus.). In Tuolumne and Mariposa counties, *Dudleya cymosa minor* (Rose) Moran was found in abundance, but the small number of males collected were not directly associated with this plant.



EXPLANATION OF MAP 3

Geographic distribution of *Philotes sonorensis* (Felder & Felder) in California.

Placer, Tuolumne, Mariposa, Santa Barbara, Ventura, Los Angeles, San Bernardino, Orange, Riverside, San Diego, Imperial.

Baja California Norte:

South to vicinity of Punta Prieta (Powell, 1958).

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BOOK REVIEW

FAUNA OF THE U.S.S.R., LEPIDOPTERA, VOL. 4, PART 2, TINEIDAE, PART 2. SUBFAMILY NEMAPOGONINAE. By A. K. Zagulajev, 5 May 1964, 424 pp., 385 text figs., 2 colored pls. Published by the Zoological Institute of the Academy of Sciences, Moscow & Leningrad, U.S.S.R. (new series no. 86) [In Russian].

This new volume of the "Fauna" forms the second part of the extensive monograph of the interesting family, of which the third part has been published already four years ago (cf. my review in this journal, vol. 15, no. 2, pp. 130-132, 1961). The present volume comprises an extensive treatment of the second subfamily, the chiefly mycetophagous Nemapogoninae, with regard to the species occurring in the Soviet Union and the adjoining countries. The source of the material is the same as before, the collections in Leningrad and Moscow, personal collecting by the author, and Wocke collection.

The set up of the work is about the same as of the third part. A chapter on general morphology of adult and immature stages comprises 55 pages; it is followed by remarks on biology; on classification and phylogeny; and on geographical distribution. Then a chapter on economic importance of the insects is added where the injury, the measures,