

MARSHAL C. HEDIN

1995 - 1996



Keuffel & Esser Company

82 0020

Weatherproof Field Book

"Rite in the Rain" All-Weather Paper

32 Leaves

4⁵/₈" X 7"

95-001

AZ: Pima Co., Santa Rita Mtns., road
to Florida Canyon Elevations
ca 3660 feet 12 August, 1995

- collecting in a.m. w/ W. Maddison,
G. Bohner, G.B. Edwards, Jennifer and
myself. Mesquite grassland
habitat - collecting using beating
sheet and sweep net, also searching
ground.

> collected Saigona, Metaphidippus chire,
Phidippus zecheus, Synemosyna, Peckhamia,
Habronethus conjunctus imm., H. tringillus
immatures, Metacryba, Paravampissa

95-002

AZ: Pima Co., Santa Rita Mtns., Florida Canyon,
up main canyon from field station,
elevations 4400-6200 feet 12 Aug, 95
> field crew @ above 31.75413
- 110.84383

collecting in riparian, oak-woodland habitats
found H. pugil, Thidius, H. clypeatus (vic. lot)
H. conjunctus (sweep net), H. doerreni, "Sidusa", Phidippus
cernius, Marpissa pikoi, Saigona, Metaphidippus,
Peckhamia

95-003

A2: Cochise Co., Huachuca Mtns.,
Garden Canyon Elevation cz. 6000' feet
14 August, 1995

- w/ G.B. Edwards, S. Mastra, G. Bohner

- oak-woodland habitat S-facing / relatively
chilly dry - rain spurts Collecting
mostly w/ beating sheet, also ground
collecting. Many ♀, imm. H. pusillus,
imm. Phidippus, Metaphidippus, Pelegrius
- Eris near stream, beating

95-004

- as above, lower in canyon, elev. ~
5300 ft. Upper picnic area.

- Eris / decent Habronatus habitat, but
too cold?

95-005

A2: Cochise Co., San Pedro River, near
Escapule Road, Elev. 4000' ft. 14 Aug, 95
- crew @ above ~ 31.59468 - 110.14805

- in low mesquite habitat, also cottonwood
riparian areas. Many H. clypeatus on
barren ground, H. freyreus? beating,
Pelegrius (2 sp?), Metaphidippus.

- relatively low diversity. Almost nothing
near river

95-006

AZ: Pima Co., Santa Catalina Mtns.,

Pima Canyon Trail Elev. ca. 3300-ft

16 August, 1995 32.35526 -110.93747

- collecting with G.B. Edwards, G. Bodner
and P. Gerben

- collecting in canyon wash, near
cottonwoods. Mostly sweeping
and beating grass clumps in
creek-bed; best near small pools
of H₂O. Collected H. hirsutus,
H. clypeatus, H. hallani. Should
have found (but did not look) H. cf. fallax
and H. virgulatus on hillsides.

95-007

AZ: Pima Co., Rincon Mtns., Miller

Creek Trail Elev. 4800-6200 ft.

19 August, 1995 w/ Jennifer

- collected along trail between Happy Valley
trailhead and Happy Valley Saddle - mostly
in e-facing oak woodland. immature
H. pusillus and "Sidusa" on
ground; Sessacus found on mountain.

95-008

AZ: Pima Co., Rincon Mtns., Rincon Peak

Trail Elev. 6200-7400' 19 August, 1995

w/ Jennifer
(~ 32.13917
-110.52242)- collecting on trail from Happy
Valley Saddle to Rincon peak, onlyp.m. Still H. pugillus immatures

in oak litter along trail. Also

imm. H. oregonensis in rockyopenings. Looking for H. z. Hensin grassy clearings - some good
habitat, but weather marginal.Found ♂ P. tyrelli on rock in
clearing. Rained out before
reaching peak.

95-009

AZ: Pima Co., Rincon Mtns.,

Miller Creek Trail Elev. ~ 4400'

20 August, 1995 w/ J

- low elevations near trailhead.

Looking for H. gerronioides, no luck.Many H. clypeatus.

32.15242

-110.48558

95-010

AZ: Pima Co., Santa Catalina Mtns.,
Soldier Trail, near trailhead Elev.
3200 ft. 27 August, 1995 w/J

- collecting ♀ saw come up, in upper
"Sonoran" desert habitat - e.g., Saguaro, etc.

Looking for H. virgulatus and

H. cf. fallax - Both very common

as soon as habitat warmed up.

fallax found on larger rocks? - both
species in open, rocky areas.

31.80875

-110.38086

95-011

AZ: Cochise Co., Whetstone Mtns.,
Trench Joe Canyon Elev. 4000-5000 ft.
3 Sept, 1995 w/J Hedinger

- hiked from canyon bottom to

large hillside on north-side - open

grassy desert merging into thin

oak-woodland w/ junipers. Collected

♀/imm. H. pugillii near oaks,

H. clypeatus in open areas,

H. conjunctus in grass. Also,

Phidippus carnifex? near H₂O in

canyon bottom.

95-012

AZ: Pima Co., Santa Catalina

Mts., vic. Mt. Lemmon summit

Elev. 8600-9000 ft. 9 Sept, 95

w/ Jennifer

- looking in several A habitats

near summit. most open, grassy,

small rocks. looking for H. oregonensis,

perhaps H. zlotovus weather not

great! Found several ♀/♂

Phidippus tyrelli? no Habronattus.

95-013

AZ: Cochise Co., Canelo Hills,

Upper Badie Canyon Elev. ca. 6000ft.

10 Sept, 95 (~31.41837 -110.42964)

w/ large group of people (helpers including

H. Green), Wayne, S. Mista, Jennifer.

Oak-woodland habitat, looking for

H. pusillus. I found many H. dorsalis,

and single ♂ H. pyrrithrix near

small pond-edge vegetation. Wayne

found a few H. pusillus subadults.

95-014 AZ: Pima Co., Santa Rita Mtns.,
Florida Cyn. Trail, Elev. ca.
5500' 17 Sept. 1995 w/

Maddison Labbies

-hiked up Florida Cyn. trail from
field station, ~ 1/4-1/2 mile, ~ 9 am.

Sketching oak-woodland slopes

for H. pugillis found many ♂♂,

fewer ♀♀ ♂♂ fairly active.

(~ 31.38467 -110.3899)

95-015 AZ: Cochise Co., Huachuca Mtns.,
Sycamore Canyon, Elev. 5-6000 ft.

17 September, 1995 Jennifer

collected H. dossenus in oak

habitats, similar to Upper Bodie

Cyn (95-013)

95-016 AZ: Santa Cruz Co., Santa Rita Mtns.,

Old Baldy Trail - from ca. 5500' to

above 7000' @ Mt. Wrightson Peak

29 Sept, 95 w/ Jennifer

- collected many H. pugillis on lower part

of trail (Naderz Cyn.) in oaks. Looking for

H. oregonensis higher, but found only

juv. H. dossenus. Also phidippus tyrelli?

95-017

A2: Pine Co., Piute Mtns.,
Madrone Canyon Elev 3800-5200
feet 21 October, 95 w/
UFA group led by Mark Fishbein
- on hike up to Canyon, saw
H. elypeatus ♀, H. confusus ♂ &
trailside. Dropped into canyon, did
mostly beating - collected Metaphidippus
mauii, Pelevin choleola?, Phidippus sp.,
Thidius ♂ collected ♂ H. hirsutus

96-001

CA: Glenn Co., ~3 mi. E Interstate 5
off Norman Road, adjacent to Sacramento
NWR 2 January, 1996 elev. ~100 ft.

- collecting along grassy roadside w/
pampas grass debris. Temp unusually
mild, ~65°F Hebronathus fairly active
in spots out of wind - collected
4 large subadults, most ♂; identified @
H. klausneri - weedy sp in CA

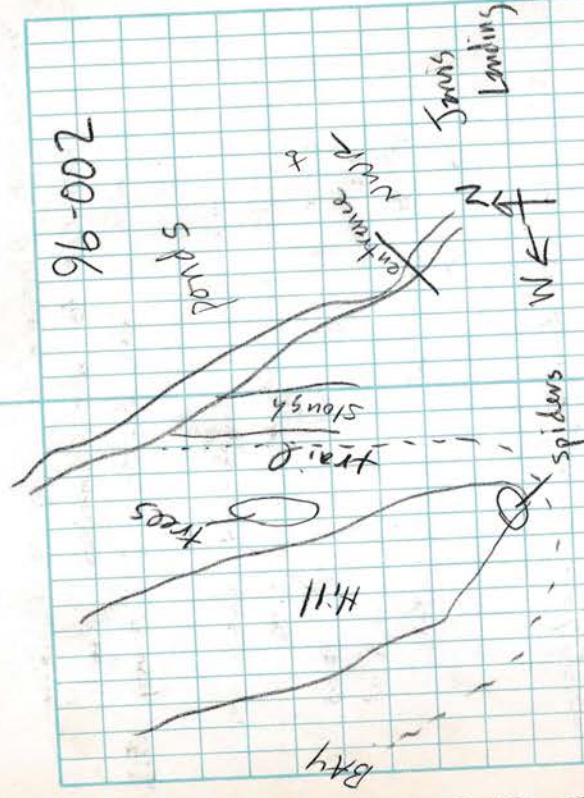
96-002 CA: Alameda Co., Jarvis Landing,
adjacent to San Francisco Bay
NWR Elev. 50 ft. 3 January, 1996

- collecting on serpentine outcrop on
hillside adjacent to salt marsh habitats -
sparse grassy veg w/ small rocks.
~65°, warm for January. Collected
♂, ♀, 3 large imm. H. tarsalis -
saw a few others

96-003 CA: San Bernardino Co., Sacramento Springs,
near junction of Hwys 95/40 west
of Needles, elev. ~400 ft. 4 January, 1996

- collected 2 imm., 1 ♂ H. hirsutus @
base of palm grove in palm debris/grass;
vic of spring. temp ~70°

96-004 AZ: Cochise Co., Ruckel Canyon Road near Camp
Rucker, Chiricahua Mtns 10 February, 1996
elev ~6000 ft.
collected pen ♂ H. dorsalis in mixed oak/juniper
woodland; Juniper-dominated. Also collected graphonids,
erigonids under rocks. Still very cool @
night.



96-002

~ 31.88854 -109.20841
96-005 AZ: Cochise Co., roadside close to
Southwestern Research Station, Chiricahua Mtns.,
~ 5200 ft. 11 February, 1996 w/ Jennifer
- collecting on rocky, gentle slope adjacent
to road; S-facing; mid-day / overcast; ~65°.
Many ♀, pin ♂, 1 ♂ H. clypeatus. Not
sure whether other species are present.

96-006 AZ: Chiricahua, Onion Saddle, 7600 ft.
- ♀, pin ♂ in high oak woodland
w/ pine; ~ 2pm; S-facing
Hebronethus clypeatus 31.93394
-109.26356

96-007 AZ: Pinal Co., Picacho Peak SIP
~2000 ft 15 February, 1996
- collecting on W side of park,
off trail on hillslopes. Hot most of
mid-afternoons. Collected ♀ Terrilomys,
♂♀ H. virgulatus. Did not find
H. zeugma. H. v. stultus also missing - too hot?

96-008 AZ: La Paz Co., Ehrenberg, banks of
Colorado River 23 February, 1996 v. peruviana
- collecting on sandy (1 yd) water edge w/ bare little rocks.
Found H. pygmaeus ♂, pin ♂, H. constrictus ♂♀

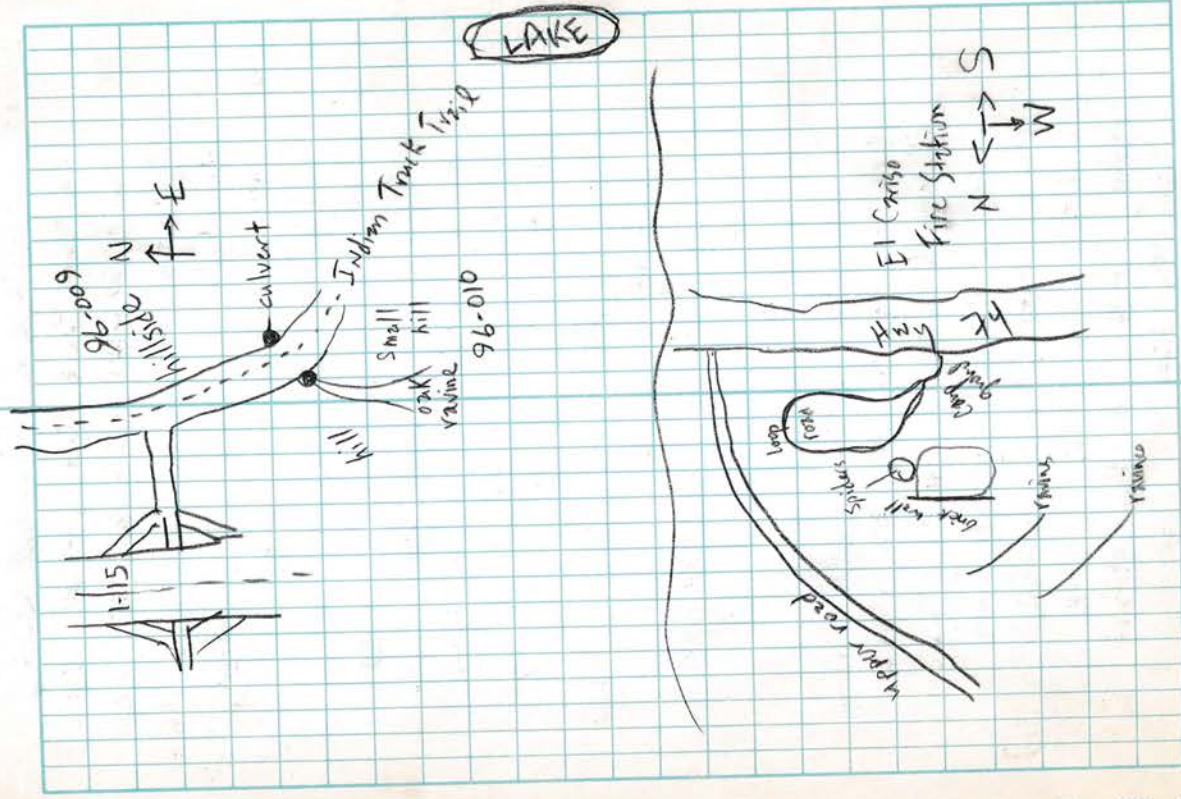
33.75002

-117.94876

96-009 CA: Riverside Co., Temescal Wash,
Indian Truck Trail Exit off of I-15
Elev. ~350 meters 24 February, 1996
- early 2.m. collecting on open, grassy hillside
east of ITT. Lots of H. areolaris, (adults)
some immature H. californicus in
grassier areas

96-010 CA: Riverside Co., Temescal Wash, Indian
Truck Trail Exit of I-15 Elev. 350 m
24 Feb, 1996 west side of ITT,
collecting in oak ravine and
small grass flat on "small hill" found
H. oregonensis pen ♂ & near oaks. Also
adult ♂ H. californicus & immatures
in grass on flat.

96-011 CA: Riverside Co., Elsinore Mtns., El Cerrito
Campground off Hwy 74 Elev. ~850 m
24 February, 1996 Collected H. oregonensis
in oak habitats in campground. Found
many H. areolaris group ♂♂ (possibly H. ustulatus)
in barren rocky habitats & base of
washes, trails, on large artificial flat
near brick wall near Chaparral



86-012

CA: Orange Co., San Juan Creek,

~1 mi. E of Trampas Cyn, off Hwy 74

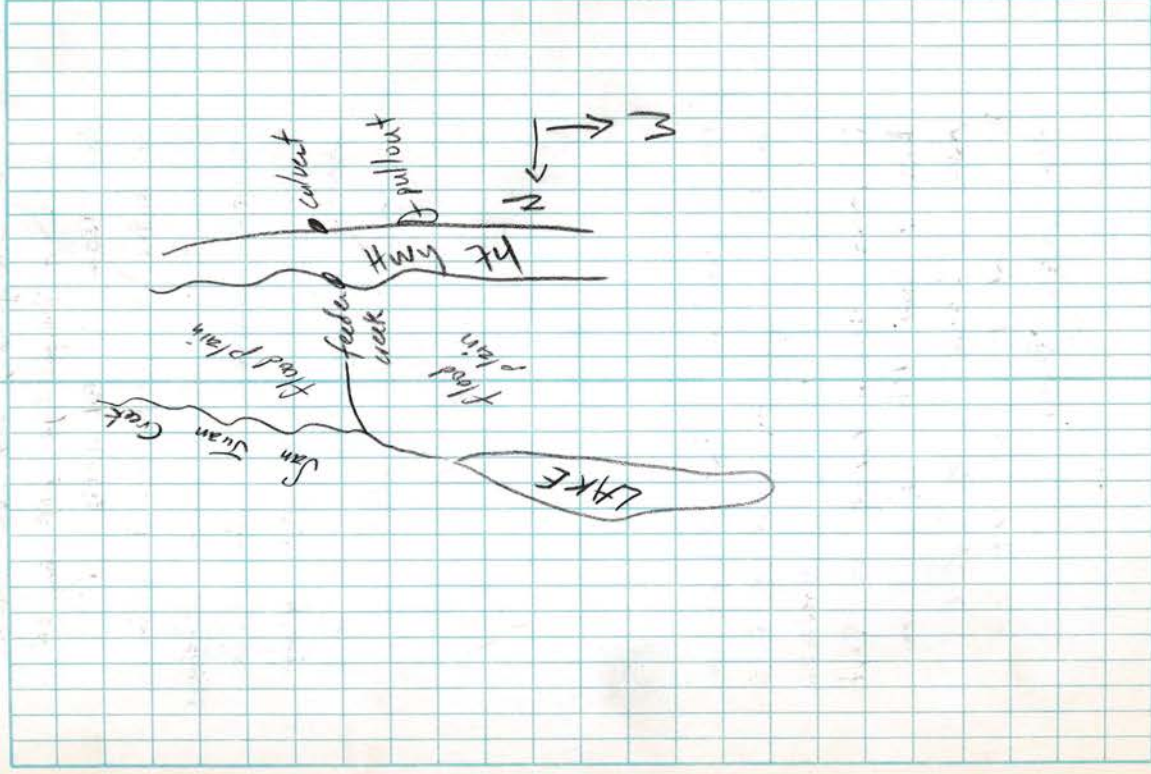
Elev. ~150m 24 Feb, 1996

-collecting on sandy flood plain
adjacent to creek. Many H. elegans
on rocks, sticks in sandy areas

Also imm. H. coerebus group

Species (H. pyrrhrix) in
more stable habitats

* when in vicinity: intact habitats in
San Mateo Canyon Wilderness @ S. end
of Santa Ana Mtns., interesting
limestone plateau habitat on Santa
Rosa Plateau (Nat. Cons) in same
area. Contact Steve Boyd @
Rancho Santa Ana for more info.
Also Paris Banks



96-013 AZ: Cochise Co., Apache Pass Road,
vic. trailhead to Ft. Bowie Nat. Hist. Site
Elev. ~ 4,500 ft. 2 March, 1996
w/Jennifer collected H. virgulatus
adults in open, rocky habitat
Also H. lycopatus imm in grassier
spots. Saw many more H. virgulatus
than collected. 32.1567
-109.4527

96-014 AZ: Cochise Co., Willcox Playa, North
end, on road W of Hwy 186,
opposite Moore Ranch Road Elev. ~ 4100'
2 March, 1996 w/Jennifer. Collecting
in stabilized dune, and flat habitats
N of playa proper. Midday - hot!
Single H. ustulatus ♂ collected.

96-015 AZ: Cochise Co., Paige Creek Canyon, N
of Little Rincon Mtns., Elev. ~ 4000'
17 March, 1996 32.1685 -110.43106

H. lycopatus streamside; H. ustulatus ♂
on barren ground in rolling
hills.

96-016 AZ: Santa Cruz Co., Patagonia Mtns.,
mouth of Italian Canyon @
Sycamore Cyn. Elev. 4600 ft.
10 April, 1996

- collected 2 ♀, 2 ♂ Hypsigillus
on oak slopes south of road, N-
facing slope. Very dry - late in
year for this pop. Also 2 ♂
H. hirsutus.

96-017 AZ: Santa Cruz Co., Patagonia Mtns.,
Duguesne Road, ~ 1 mi. W of
Harshaw Road Elev. ~ 6000' 10 April, 96
- in excellent oak woodland habitat,
looking for Hypsigillus. Very windy,
2 ♀♀ found.

96-018 AZ: Mohave Co., 23.5 mi. SE Wikieup
on Hwy 93 Elev. ~ 3000 ft. 20 April, 1996
- juniper woodland w/ small, low oaks. Collected
H. elyptus, adult ♂ ♀ 3 34.57035
- 113.46635

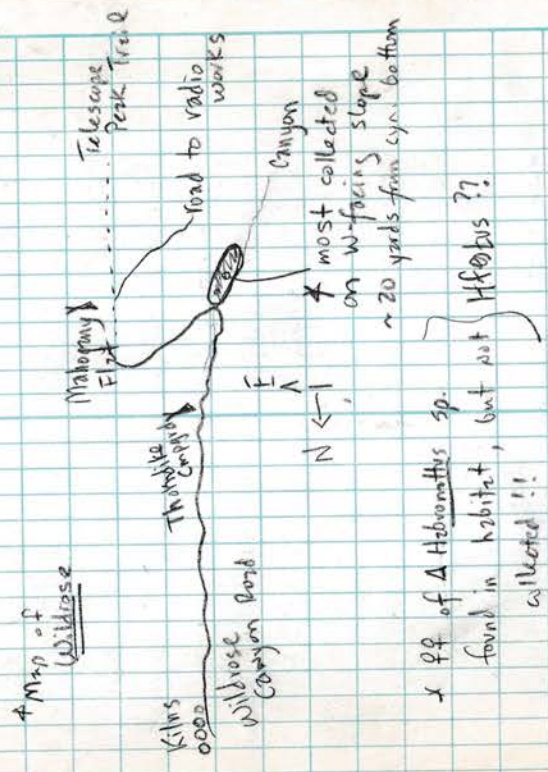
96-019 AZ: Mohave Co., Hualapai Mtns. Ford, Hualapai
Mtn. County Park Elev. ca 7000 ft., 20 April, 1996
- "chipmunk" w/ Ponderosa Pine habitat. Collected
H. oregonensis in open, rocky areas in
chipmunk. Also stream side habitats.

96-020 CA: Inyo Co., Panamint Mts., Telescope Peak Trail Elev. 9-10,000 ft. 21 April, 1996
 - collecting in open, rocky subalpine habitats along trail. Very little snow.
Pellaea sp. adult ♂♀ abundant. Cirrus that no H. americanus group spiders were found @ these elevations - too early?

96-021 CA: Inyo Co., Panamint Mts., Upper Wildrose Cyn. Elev. 8,000 ft. 21 April, 96
 - collecting in canyon bottom, gentle slope
 habitats: pinyon + pine, sage dominant.
H. americanus fairly common around sage, on small rocks, sticks. Adult ♀♀, peruvittimide ♂♂, many smaller individuals.

96-022 NV: Clark Co., Spring Mts., Lower Lee Cyn., 8.8 mi. W Hwy 95 on Hwy. 156 Elev. ~4000 ft., 22 April, 96 - besting in wash habitat w/ Joshua tree. imm. Phidippus, ♀ Metaphidippus, ♂♂ ♂ dendryphantine

96-021



96-023 NV: Clark Co., Spring Mtns., Lee Canyon, Hwy 156 1/2 mi. E Hwy 158 junction Elev. 7600 ft. 22 April, 96

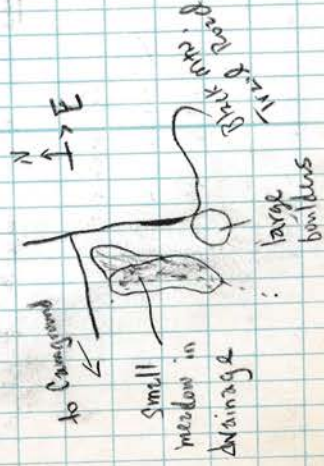
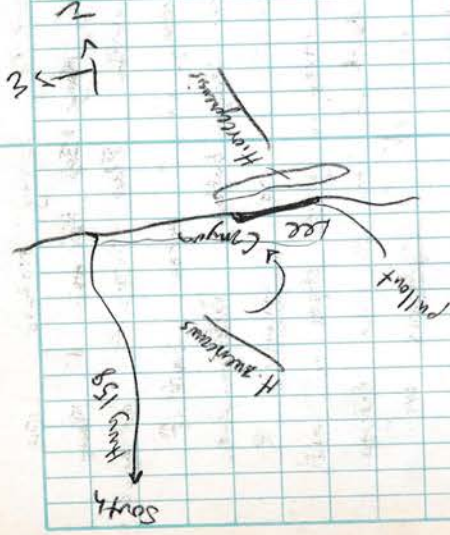
- collecting in 2 areas. South of highway in canyon bottom - Ponderosa pine, sage habitat - collected H. americanus ♀, pen ♂, many on gentle slope w/ small rocks - North of Hwy on oak, piñon hillside collected H. oregonensis on rocky slopes.

96-024 NV: Clark Co., Spring Mtns., Lee Canyon, vic. McWilliams Campground Elev. ~ 8,600 ft. 22 April, 96

- collecting on rocky slope w/ Ponderosa Pine, adjacent to ravine. Very little vegetation cover. Collected imm ♂, ♀ H. americanus. Also imm ♀ Pseudotsuga

96-025 CA: Riverside Co., San Jacinto Mtns., 1/2 mi. E Badger Basin Campground, Black Mtn. Trail Road Elev. 7,000 ft. 17 May, 1996 * (Lake Falmor Quail)

- collecting in meadow / marsh habitat of pine forest; fairly open w/ small rocks, pine litter. Collected 1 ♂, 1 ♀, 2 ♀, 3 imm. H. americanus. 1 ♂ H. californicus in more open habitat



Camatta Ranch

96-026 CA: Los Angeles Co., Hwy 2, "Blue Ridge"
pullout, W of Ski Sunrise Elev. 7381 ft.
18 May, 1996 * (Mount San Antonio Quad)
- collected Pellaea on open, rocky ground.
(p♂, 2♀) H. oregonensis @ bottom
of draw in oak / sage habitats (3♂)
Found NO H. zamenis @ lower elevations
in apparently good sage habitats.

96-027 CA: Kern Co., Mt. Pinos Road, vic.
McGill Campground Elev. 7200 ft. 18 May, 96
- found 2♀, 1♂ H. amnicus in
conifer forest w/ sage, "marsh" habitats.
collecting difficult, weather decent.
Also found ♀ Pellaea on open slope.
* (Cuddy Valley Quad)

96-028 CA: Tulare Co., Kern River, ~ 6 mi. N
Kernville on Sierra Way Elev. ~ 2,800 ft.
19 May, 96 * (Kernville Quad)
- early a.m. collecting in floodplain
habitats adjacent to river - sandy
soils. Collected 2♂ H. californicus,
near oaks in litter.

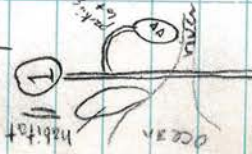
96-029 CA: San Luis Obispo Co., Cholame Creek
@ Palo Picta Cholame Rd, ~ 1 mi. W Cholame Elev. 1100 ft.
19 May, 96 * (Cholame Quad)
- 1♂ H. californicus collected in grass adjacent
to stream in flood debris (e.g. small sticks)

96-030 CA: Monterey Co., Hwy. 616 along Finch
Creek, ~ 20 mi SE Carmel Valley Elev. ~ 2,100 ft.
18 May, 96 * (Chow Ridge Quad)
- collecting late in day next to creek. Found
2♂ H. peckhami, ♂ Metacynus on rocks @
streamside. Also 2♂ H. oregonensis in
oak litter adjacent to streamside
habitat.

96-031 CA: Monterey Co., Asilomar Conference Center,
vic Pacific Grove Elev. ~ sea level 22 May, 96
- collecting on stabilized dune habitats
in vic. of conference grounds H. tarsalis
fairly common in short grass w/ cypress
litter / also large lupines. Collected total
of 4♂, 3♀ (2 w/ eggs) individuals. Saw, but
failed to collect, Δ sp. of Hobomastus?
* (Monterey Quad)

96-032 CA: Mendocino Co., Hwy 253, ~ 2 mi. E Boonville Elev. 600 ft. 24 May, 96
- searching short grass habitats on serpentine outcrop, early a.m. Found only 2 *Pellaea* * (Boonville Quad)

96-033 CA: Mendocino Co., Big River Beach, 39.3031 -123.7927
off Hwy 1 near Mendocino Elev. Sea Level 24 May, 96 * (Mendocino Quad)
- "coastal strand" habitat @ noon, good weather. Collected 3♂, 1♀ w/eggs, 1 pot, 2 imm. *H. mustelata* in grassy spots, small sticks, etc.



96-034 CA: Mendocino Co., Westport - Union Landing State Beach, Hwy 1 Elev. sea level 24 May, 96 * (Westport Quad)
- ♀ *H. hirsutus*, ♀ *H. mustelata* in coastal strand habitat

96-035 CA: Mendocino Co., Hwy 1, ~ 5 mi. W of Leggett Elev. ~ 1,000 ft. 24 May, 96
- 1 ♂ *H. oregonensis* @ roadside pullout - rocky bank - *H. ophrys* collected here previously, but habitat gone!?

96-036 CA: Mendocino Co., South Fork Eel River @ Smith Redwoods State Reserve, Hwy 102 Elev. 900 ft. 24 May, 96 * (Piercy Quad)
- ♂ *Sitticus* on small rocks next to river; No *H. bellatoris*?

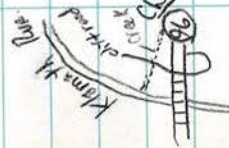
96-037 CA: Humboldt Co., NW side of Stone Lagoon, off Hwy 101 Elev. sea level 25 May, 96
- early, sunny morning, ~ 60°F. Collecting *H. ophrys* in coastal strand, 11♂, 4♀, 6 imm total - very common!! Sand + small plants / grass * Also in taller grass / marsh. (Orick Quad)

96-038 CA: Humboldt Co., Lyons Ranch of Redwoods N.P., off Bald Hills Road Elev. 2,800 ft. 25 May, 1996 * (Bald Hills Quad)
- collected ♂, ♀ *H. ophrys* on open, grassy hillside. Mid-day, weather good.

* Searched in open conifer habitat @ higher elevations on Bald Hills Road, w/out success. Weather perfect! Curious!!!

96-039 CA: Humboldt Co., Klamath River @ Orleans,
off Hwy 96 Elev. 400 ft.
25 May, 96 * (Orleans Quad)

- Looking along Klamath on small
rocks - habitat of H. bellatoris
Collected 8♂ 3♀; also 1♂ Siltiers.
Most spiders on continuous rocky
habitat very close to river!!



96-040 CA: Siskiyou Co., 8.3 mi. W Lake Siskiyou
on W.A. Barr Rd., near Gumboot Lake
Elev. ~6,000 ft. 26 May, 1996 * (Sweet Lake Basin)
Quad

- in open habitat of ponderosa pine
forest, w/ sparse sage. Collected
3♂, 1♀ w/ eggs H. hirsutus; 3♂, 1♂, 3♀,
6 immature H. americanus - small rocks,
sticks, etc. Weather partly cloudy.

96-041 CA: Siskiyou Co., Klamath River @ Trees of
Hewen Campground, Hwy 96 * (Badger Mountain)
Quad
Elev. 600 meters 27 May, 96

- collecting in floodplain of Klamath,
grassy habitat, fairly sandy. Collected
6♂, 1♀ H. trisulcis, 1 imm. Philopis.
Most tarsals in vic. of sand, w/
tall grass.

96-042 OR: Jackson Co., Mt. Ashland Campground, S of
Mt. Ashland, off Hwy 20 Elev. ~7,000 ft.
27 May, 96 * (Mt. Ashland Quad, OR)

- windy, p.m., but sunny. Collecting on open,
rocky slopes above alpine meadow habitat.
Collected 11 imm, 1♂ H. bulbipes. Too early
for this species!! Collections made here
previously (1993).

96-043 OR: Jackson Co., 6.5 mi. W Siskiyou on
Hwy 20, towards Mt. Ashland Elev. ~5,200 ft.
27 May, 96 * (Mt. Ashland Quad, OR)

- late p.m.; looking in open areas of
pine forest, on pine needles, sticks, etc.
Collected 2♂, 2♀, 2 imm. H. junceus!!
Very nice! Not much grass.

96-044 CA: Siskiyou Co., Lake Shasta, Big Springs
Road Elev. 860 meters 28 May, 96 * (Sumner Flat Quad)

- searching on rocky hillside of juniper / sage
habitat, also sage / juniper sandy flats.
Many H. hirsutus (1♀ collected) ♀ Hebro?
found on hillside - possibly H. festus?
Something must be in this habitat.

96-045 CA: Siskiyou Co., May Springs, S of
Mt. Shasta City Elev. 3000 ft. 28 May, 96
- searching grassy, rocky habitats
in pine/oak woodland. Only H. oregonensis
(♀, 4 imm) found - disappointing!
*(City of Mount Shasta Quad)

96-046 CA: Siskiyou Co., McCloud River, near Lower
Falls, off Hwy 89 Elev. 3,200 ft.
28 May, 96 *(Lake McCloud Quad)
- open sage, pine forest habitat. Collected
1♂, 3♂, 1♀, 3 imm. H. americanus at
~ 1200 noon - Found ♀ eating adult ♂!
Nice habitat!

96-047 CA: Shasta Co., Subway Cave Picnic Area,
1 mi N Old Station, off Hwy 89 Elev. 4,300 ft.
29 May, 96 *(Old Station Quad)
- collecting in early a.m. / sunny. Sage,
pine habitat, volcanic flats. Many
H. americanus (5♂, 2♀, 2 imm) - also
4♂, 2♀ H. hirsutus, 1♂ H. minimus.
Most americanus in vic. sage, others
in more open areas (small rocks).

96-048 CA: Plumas Co., near Lake Almanor, Hwy 147
19 mi. N jct. Hwy 89 Elev. 4,600 ft. 29 May, 96
- collecting in small forest clearing (artificial) and
along old trail in Ponderosa pine forest
w/ sage, etc. Collected 2♂ H. americanus in
grassy spots, 1 im / 2♂ H. oregonensis in
more open areas. 3♂ H. hirsutus on
rocks, especially on lake shore.

96-049 CA: Plumas Co., Hwy 89 @ Middle Fork Feather
River, near Blairden Elev. 4,900 ft. 29 May, 96
- habitat included low, continuous, rather
grassy sage above river flood plain;
grass/sage mixed on flood plain
w/ sandy soils. Surprised to find
2♂ H. musteloides, well E of
my current record! Also, 2♂, ♀
H. hirsutus in sage, some rather
high on sage ~ 2 p.m., slightly
windy. *(Blairden Quad)



96-050 CA: Sierra Co., Hwy 89 1 mi. S Randolph
Elev. ~ 5200 ft. 29 May, 96 *(Sierraville Quad)
1♂ H. oregonensis collected on dry, rocky

hillside - large pine trees, sage, some oaks?
→ late in day, but warm

96-051 CA: El Dorado Co., Hwy 50, 2.7 mi. N
 jct. w/ Hwy 89, vic. Myers Elev. 6200 ft.
 30 May, 96 * Early a.m., sunny
 - collecting in disturbed low sage
 habitat adjacent to road, near
 storage facility. H. americanus very
 common (11♂, 3♀, 2 imm, 1 pup) in / on
 live & dead sage. * (Echo Lake Quad)

96-052 CA: Alpine Co., Monitor Creek, 1 mi. NW
 Heenan Lake, Hwy 89 Elev. ~6400 ft.
 30 May, 96 - Collecting along
 stream @ bottom of narrow riparian area.
 Habitat of large sage, large willows, small
 grassy clearings. Collected 2♂, 1 imm H. cf. minima.
 in grass - very difficult. Looks like
 new species !!! Also 1 ♂ hirsutus in sage.

96-053 CA: Alpine Co., 1/4 mi. W Monitor Pass, off
 Hwy 89 Elev. 8200 ft. 30 May, 96
 - on gentle slope of hillside adjacent
 to lakebed, low sage. Collected
 5♂, 4♀ H. amicus out on rocks
 between sage - very obvious. Should
 have seen H. simsoni on sage flats?
 * (Heenan Lake Quad)



96-054 CA: Alpine Co., Monitor Pass Hwy 89 Elev.
 30 May, 96 * (Tornaz Lake Quad) ~8300 ft.
 - collected in low sage flats south of 89 @
 Monitor Pass. Substrate dirty, w/ lots of
 sage sticks. Found 1♀, 1 pup, 5 imm of what
 should be H. simsoni. Pop sizes must be
 huge given large habitat range?

96-055 CA: Mono Co., Devil's Gate Summit, Hwy 89,
 E. of Foles Hot Springs Elev. 7519 30 May, 96
 - collecting on pine / sage flats adjacent
 to highway - 3♂, 2 H. americanus collected,
 all associated w/ sage, either dead or
 alive. Relatively late in day, kinda
 windy. * (Foles Hot Springs Quad)

96-056 CA: Mono Co., Mono Lake, vic. Lee Vining
 Elev. 6400 ft. 30 May, 96 * (Lee Vining Quad)
 - searching grass habitats near shores of
 Mono Lake. Found spiders in habitat
 w/ small pebble substrate. Other good
 habitats, but fairly late in day. Collected
 1♂ Pellaea; 4 pup H. tarsalis?

96-057 CA: Inyo Co., "Intake 2" Campground, off Hwy 168 near Aspendell Elev. 8,000 ft. 31 May, 96 * (Mt. Thompson Quad) - collecting in a.m. in sage flat habitats. Fairly cool @ this elevation. Walked hard for 3 $\frac{1}{2}$, 1 $\frac{1}{2}$, 1 imm. H. americanus (very skittish). Also collected 5 $\frac{1}{2}$ Phidippus, 4 Pellaea (on slope).

96-058 CA: Inyo Co., Bishop, hospital grounds Elev. 1270 meters 31 May, 96 * (Bishop Quad) - in cottonwood grove W of hospital, tall eye grass w/ cottonwood leaf litter. Collected 4 $\frac{1}{2}$, 1 $\frac{1}{2}$ H. tarsalis; 3 $\frac{1}{2}$, 1 $\frac{1}{2}$, 5 $\frac{1}{2}$ H. klasseni; 1 $\frac{1}{2}$ H. formosus. Taraxacum apparently in more open patches?

96-059 CA: Inyo Co., White Mountains, ^{vic. Schulman} Grove Visitor Center Elev. 10,055 ft. 31 May, 96 * (Blanco Mountain Quad) - collecting in low sage habitats in valley, on valley slope - mixed w/ sparse grass. Collected 2 $\frac{1}{2}$, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 2 imm. H. americanus - again, habitat extensive - pop size large. Also found 2 $\frac{1}{2}$ Pellaea (2 Δ sp) on rocks of hillside w/ bristlecone pine.

96-060 UT: Washington Co., Upper Pine Valley, South Snipe Park Campground Elev. 1 June, 96 - collecting in oak savannah habitats w/ occasional sage ~ flat; H. festus common, collecting 5 $\frac{1}{2}$, 6 $\frac{1}{2}$, 2 $\frac{1}{2}$ in grass around sage. No H. americanus Numbas this low? (Grassy Valley Quad?)

96-061 UT: Iron Co., mile 12 E of Cedar City on Hwy 14 @ Campground Elev. ~ 6,400 ft. 1 June, 96 * (Flanigan Arch Quad) - 1 $\frac{1}{2}$, 2 imm & H. festus found on rocky flat atop small hill - some pine tree sticks, etc. No H. americanus?

96-062 UT: Iron Co., mile 17 E of Cedar City on Hwy 14, vic. Bristlecone Pine Trailhead Elev. 9,900 ft. 1 June, 96 * (Navajo Lake Quad) - collecting in interesting aspen litter, spruce habitat adjacent to alpine meadow. Previous site of H. cf. americanus D. Medison collection (6 $\frac{1}{2}$'s cryptic). Spiders very common, collected 7 $\frac{1}{2}$, 5 $\frac{1}{2}$ in less than $\frac{1}{2}$ hour - saw many more. Interesting habitat for americanus group member? Need to look more @ this habitat in future.

96-063

AZ: Coconino Co., Hwy 67 @ mile 581,
 ~ 11 mi. S Jacob's Lake Elev. 8747
 2 June, 96 * (Telephone Hill Quad)
 - collecting in litter of open grove
 @ roadside - fairly dirty substrate.
 Collected 3♂, 4♀, 2p♂, 1 imm *H. festus* -
 No other species obvious?

96-064

AZ: Coconino Co., Hwy 67 @ mile 604,
 ~ 24 mi. S Jacob's Lake Elev. ~ 8,700 2 June, 96
 - again, in open / spruce habitat,
 substrate rockier; sparse grass.
 Collected only 2p♂, 1 imm of
H. festus. Where is *H. zittensis*?
 * (Telephone Hill Quad)

96-065

AZ: Coconino Co., Hwy 67 @ mile 588,
 ~ 8 mi. S Jacob's Lake Elev. ~ 8,600
 2 June, 96 * (Telephone Hill Quad)
 - in open rocky habitat in mixed
 Ponderosa Pine forest. Habitat looks
 good for *H. merriami* group member or
H. zittensis. Only *H. festus* - 1♂, 2p♂,
 2♀ collected.

Video MCH TAPE #3

flashed 4-8	96-039	<i>Oulema</i>	<i>H. bellatoris</i>	5♂	DAI ♀	good -
"	"	"	"	3♂	"	nice -
"	"	"	"	4♂	"	complete -
"	"	"	"	W35♂	"	perfect -

flashed 10-31-96

96-082	Beaver, UT	<i>H. sanborni</i>	1♂	DAI ♀	O.K. legs -
96-081	Fishlake, UT	<i>H. merriami</i> ?	1♂	"	weak

Photo Log: 7-17 (Velvia)

<i>H. trassalis</i>	MCH 96-031	<i>Asilomar</i>	1♂ (1,2)	3♂ (3,4)
<i>H. trassalis</i>	96-033	Big River Beach	3♂	(5,6)
"	96-049	Fertile River	W131♂	(7,8)
<i>H. bellatoris</i>	96-039	Oulema's	W136♂	(9-12)
After km 96063	Mono ♀ (13)	96-031	<i>Asilomar</i>	♀ (14)
<i>S. trassalis</i>	96-002 (15)	Hopkins	96-037	<i>Stone Canyon</i> (16,17)
<i>H. trassalis</i>	96-034	WPL (18)	<i>H. merriami</i>	♀ 96-053 MP (19,20)
<i>S. trassalis</i>	96-036	Smith Rd (21,22)	<i>Pellene</i>	96-026 BIR (23,24)
<i>Pellene</i>	96-032	Boat (25)	/" (26)	<i>Pellene</i> White Mtns 96-050 (27)
<i>Pellene</i>	96-056	White Mtns (28)	<i>H. bellatoris</i>	♀ 96-039 Oulema's (29)
<i>H. trassalis</i>	96-043	MtA (30)	Hme 96-001	Poni (31) / Hme 96-023 Spring (32)
<i>H. bellatoris</i>	96-042	MtA (33)	Hme 96-051	Myers (34) / Hickson CC 96-062 (35)
<i>H. bellatoris</i>	km 96064	Summit Pass (36)	<i>H. trassalis</i> ?	km 96076
				strawberry (37)

Settings: file date 10-8, F16, shutter 2, AGC 4 working distance ~ 19cm

Courthouse Video: MCH Tape #1

filmed 6-5-96:		MCH Tape #1	
96-052	Monitor Creek	H. cf. <u>americanus</u>	
1♂	Duquesne Hwy ♀	good ✓	!! new
2♂	"	good ✓	z
96-055	Devils Gate	<u>H. americanus</u>	
1♂	Duquesne Hwy ♀	good -	
2♂	"	good -	
3♂	"	good -	
96-048	Lake Almaraz	<u>H. americanus</u>	
1♂	Duquesne Hwy ♀	good -	
2♂	"	O.K. (see 6-6)	
96-057	Aspendell	<u>H. americanus</u>	
1♂	Duquesne Hwy ♀	good -	
2♂	"	(see 6-6)	
3♂	"	(see 6-6)	
96-059	White Mtns	<u>H. americanus</u>	
1♂	way 1 to DQ Hwy, seg 2 to IC ♀	O.K. (see 6-6)	
96-040	Gumboot	<u>H. americanus</u>	
1♂	DQ Hwy ♀	good -	
2♂	"	good -	
3♂	"	O.K.	

MCH TAPE #1

96-046	McCloud River	<u>H. americanus</u>	
1♂	DQ Hwy ♀	excellent ✓	
2♂	seg 1 to " / seg 2 to IC ♀	O.K. (see 6-6)	
3♂	DQ ♀	O.K. (see 6-6)	
96-047 (subway), 96-024 (Springs)	<u>H. americanus</u>		
attempted, w/out success	- 1ste in day		
filmed 6-6			
96-024	Spring Mtns.	<u>H. americanus</u>	
W120 ♂	DQ Hwy ♀	good -	
W121 ♂	good seg to DQ Hwy ♀	good -	
(96-023)			
96-021	Panamint Mtns	<u>H. americanus</u>	
W119 ♂	seg 1 to DQ Hwy ♀ 2 / seg 2 to IC ♀	good ✓	
96-059	White Mtns	<u>H. americanus</u>	
1♂	seg 1 to DQ ♀ 2 / seg 2 to DQ ♀ 1	good -	
96-057	Aspendell	<u>H. americanus</u>	
3♂	seg 1 to AS ♀ 1 / good seg to DQ ♀ 2	good -	
1♂	DQ ♀	good -	
2♂	to DQ ♀	good -	
96-048	Lake Almaraz	<u>H. americanus</u>	
2♂	DQ ♀	good -	
1♂	DQ ♀	good	

MCH TAPE #1 / #2

96-062	Hwy 7 Cedar City	H. cf. <u>Sansoni</u>
4♂	DA1♀	like <u>varm</u>
5♂	IC2♀	not bad
96-058	Bishop	<u>H. tarsalis</u>
1♂	to IC2♀	nice ✓
2♂	IC2♀	O.K.
3♂	DC1♀	full, but weak **
4♂	DC1♀	wonderful ✓
filmed 6-10		
96-031	Asinuma	<u>H. tarsalis</u>
1♂	DA1♀	good - no kind stage
2♂	IC2♀	weak - ♂ in bad shape
3♂	IC1♀	complete ✓
96-041	Klamath River	<u>H. tarsalis</u>
W133♂	IC2♀	complete / good -
W134♂	IC2♀ / IC1♀	nice -
W135♂	IC1♀	good -
4♂	IC1♀ / DA1♀	nice -
5♂	IC1♀	O.K. - ♂ missing 2nd leg
end of TAPE #1		
TAPE #2		
6♂	DA1♀	good -
96-038	Hyons Ranch	<u>H. opimus</u>
1♂	IC1♀	nice ✓

96-046	McClard River	<u>H. americanus</u>
2♂	to DA1♀ / then DA2♀	good -
3♂	to DA2♀ / final seg to DA1	good -
1♂	DA1♀	nice -
96-047	Subway Cave	<u>H. americanus</u>
1♂	DA1♀ / DA2♀	good -
2♂	DA2♀ /	nice -
3♂	DA1♀	good -
4♂	DA1♀ (w/more red)	good -
6-7		NADA
96-051	Myers	<u>H. americanus</u>
1♂	DA1♀	good -
(less red) 2♂	DA1♀ / final seg to IC1♀	good -
3♂	IC1♀ / final to DA1♀	good -
4♂	DA1♀	nice ✓
5♂	"	good -
6♂	IC1♀ / DA1♀	-
7♂	DA1♀	long, good -
8♂	IC2♀ (missing 2nd leg)	weak
9♂	IC2♀	
96-062	Hwy 7 Cedar City	<u>H. cf. Sansoni</u>
1♂	to IC2♀	good -
2♂	"	nice -
3♂	"	good -

Photos

Dead stuff - faces, 4x

4-2	<u>H. americanus</u>	93-039	MH. Shasta
	<u>H. americanus</u>	DRM 93063	MT: Boulder
	"	17 June 93	Mammoth Lakes
	"	30 June 93	MH. Pinos Marsh
	"	"	" Summit
	<u>H. borealis</u>	93080	AZ: Willcox Playa
	<u>H. bulbipes</u>	Wes + Boulder	
	<u>H. Sansoni</u>	DRM 93066	MT: Golden Gulch
	<u>H. cf. americanus</u>	DRM 93076	UTAH: Hwy 14
	<u>H. ustulatus</u>	96-015	
	<u>H. fallax</u>	DRM 96004	Girauden
	<u>H. forticulus</u>	DRM 96010	Austin, TX
	<u>H. cognatus</u>	"	"
4-12	<u>H. cf. californicus</u>	15 mi N Madera,	Chihuahua
	<u>H. dosseus</u>	96-004	Puckew
	<u>H. zlyperatus</u>	96-005	SURS
	<u>H. forticulus</u>	DRM 96010	Austin
	<u>H. calcareatus</u>	DRM 96004	Girauden
	<u>H. cognatus</u>	"	"
	<u>H. californicus</u>	96-010	Indian Tank Trail
	<u>H. napsivis</u>	96-090	"
	<u>H. amicus</u>	96-011	SI Cariso

Photos

4-16

<u>H. cf. ugillatus</u>	II. 14.1	Nayarit
<u>H. elyptus</u> ? undescribed	III. 12. 96	Nayarit (W083)
<u>H. cecus</u>	III. 12. GS3.1	Nayarit
<u>H. aeternus</u>	II. 15.1	Nayarit
<u>H. aregonensis</u>	96-010	Indian Tank Trail
<u>H. conjunctus</u>	96-008	Colorado River
<u>H. fragilis</u>	96-016	Itelium Canyon
<u>H. hispidus</u>	"	"
<u>H. cf. dosseus</u>	DRM 96016	NM: vt. 90
5-8		
<u>H. americanus</u>	MCH 96-023	Spring Mitas (W1210P)
<u>H. cf. dosseus</u>	DRM 96016	NM: Hwy 90
<u>Tetradonius</u> sp	MCH 96-019	AZ: Hualepai Mts
<u>Tetradonius</u> sp	MCH 96-020	CA: Paramount Mts
<u>H. cf. ugillatus</u>	GB II. 14.1	Nayarit
<u>H. aregonensis</u>	MCH 96-019	AZ: Hualepai Mts
<u>H. napsivis</u>	MCH 96-009	Indian Tank Trail
<u>H. californicus</u>	MCH 96-011	"
<u>H. calcareatus</u>	DRM 96004	TX: nr Austin (Girauden)

Photo Log:

<i>H. hypoleucos</i>	96-005	face	Olympus Scope 1.5 m. 3
<i>H. hypoleucos</i>	96-006	"	" 3?
<i>H. hirsutus</i>	96-003	"	1.5 - 2 ~ 3

3-21:

<i>H. californicus</i>	96-010	face, body	3-16
<i>H. tarsalis</i>	96-002	♂ f, b, ♀ b	17-24
<i>H. arizonae</i>	96-011	♀ b, ♂ b, f	25-31
<i>H. hirsutus</i>	96-015	♂ b, f	32-37

4-2:

<i>H. californicus</i>	Imi. E. Torache		
<i>H. hypoleucos</i>	Jacks Gyo - GB		
<i>H. tarsalis</i>	96-002		
<i>H. californicus</i>	96-010		
<i>H. elegans</i>	96-012		
<i>H. klausei</i>	96-001		
<i>H. hirsutus</i>	96-007		
<i>H. californicus</i>	III. 14 GSB. 1 (Maynit)		
<i>H. hirsutus</i>	unds. III. 12 GSB. 1 (Maynit)		
<i>H. aztecus</i>	III. 15. 1 GSB (")		

Photo Log: 7-15 (Velvia)

<i>H. arizonae</i>	96-047	Subway	4♂ (1,2) / 1♂ (3,5) / 5♂ (6,7)
"	96-046	McCloud	3♂ (8,9) / 1♂ (10,11)
"	96-057	Aspendell	3♂ (12,13)
"	96-051	Myers	9♂ (14,16) / 2♂ (17,18) / 8♂ (19)
"			4♂ (20-22) / 6♂ (23) /
"	96-023	Loe Gyn	W121♂ (24,25)
<i>H. f. sansoni</i>	96-062	Cedar City	3♂ (26,27) / 4♂ (28,29)
"			5♂ (30) / 7♂ (31,32) / 6♂ (33)
<i>H. sansoni</i>	dm 96025	Bull River	1♂ (34-36)
<i>H. arizonae</i>	dm 96065	Tioga Pass	1♂ (37)
(7-16)	Velvia		
<i>H. arizonae</i>	dm 96076	Strawberry	1♂ (1,2)
"	dm 96091	W Sonora Pass	1♂ (3-5)
<i>H. f. klausei</i>	dm 96087	Leavitt Creek	1♂ (6-8)
"	dm 96084	Sonora Pass	6♂ (9,10) / 3♂ (11) / 4♂ (12,13)
"			9♂ (14) / 5♂ (15,16) / 2♂ (17,18)
"	96-052	Monterey Creek	1♂ (19,20)
<i>H. arizonae</i>	dm 96065	Tioga Pass	1♂ (21)
<i>H. tarsalis</i>	96-041	Klamath	6♂ (22,23) / W122♂ (24) / 4♂ (25,26)
"	96-058	Bishop	4♂ (27-29) / 3♂ (30)
<i>H. f. klausei</i>	96-037	Stone Canyon	7♂ (31,32) / 5♂ (33,34) / 6♂ (35)
			4♂ (36)

Photo Log : 6-29 (Fujichrome Velvia)				Frames
U. americanus	96-027	Mt. Pinos	1 ♂	1-5
H. bulbipes	96-042	Mt. Ashland	1 ♂	6, 7
H. sansoni	DM 96025	BC Bull River		3 ♂ (8), 2 ♂ (9-11)
H. cf. americanus	96-062	Cedar City	2 ♂	12-15
"	96-052	Monterey Creek	1 ♂	16-18 (20)
H. americanus	96-024	McWilliams	W120 ♂	19, 20
"	96-021	Panamint	W119 ♂	21-23
"	96-051	Myers	3 ♂	24-26
"	96-057	Aspenelli	1 ♂	27, 28
"	96-048	Lake Almanor	1 ♂	29-31
"	96-055	Devil's Gate	3 ♂	32-34
"	96-046	McCloud River	2 ♂	35 →
Photo Log : 7-4 (K64)				Frames
H. cf. americanus	96-025	San Geronimo	1 ♂	1
"	96-028	Kearney River	1 ♂	2, 3
H. juncatus	DM 96052	Idaho	1 ♂	4-6
"	96-043	Mt. Ashland	1 ♂	7-11
H. cf. H.	96-060	Pine Valley	2 ♂	12-14
"	96-063	Hay 62	1 ♂	15-17
H. cf. H.	96-058	Rishop	4 ♂	18-20
H. bulbipes	96-039	Orleans	4 ♂	21-26
H. cf. H.	96-030	Sancti City		2 ♂ (27, 28) / 1 ♂ (29, 30)
H. cf. H.	96-047	Subway	1 ♂	31, 32
H. cf. H.	96-053	Monterey Pass	1 ♂	33-36
"	"	"	"	37
"	"	"	4 ♂ (10, 15, 8)	37

Photo Log : 7-6 (K64)				Frames
H. tarsalis	DM 96063	Mono Lake	1 ♂	2-4
"	96-058	Bishop	3 ♂ (5, 6) / 4 ♂ (7, 8)	
"	96-041	Klamath	W133 ♂ (9, 10) / W134 ♂ (11-13)	
"	96-031	Asilomar	3 ♂	14-16
H. phryx	96-038	Lyons Ranch	1 ♂	17-19
"	96-037	Stone Lagoon	8 ♂	20-23
H. musteloides	96-033	Big River Beach	3 ♂ (mic)	24-27
"	96-049	Feather River	W131 ♂	28-33
H. americanus	96-059	White Mtns	2 ♂ (mic)	34 →
Photo Log : 7-7 (K64)				Frames
H. americanus	96-047	Subway	2 ♂	1-3
"	96-040	Gumboot	1 ♂ (4) / 2 ♂ (5-7)	
"	DM 96065	Tloga Pass	1 ♂	8-10
"	DM 96076	Strawberry	2 ♂	11-13
"	DM 96077	Chipmunk Flat	1 ♂	14-17
DM 96091	W. Sonora Pass	1 ♂	18-20	
H. bulbipes	96-042	Mt. Ashland	1 ♂ (mic)	21-23
H. cf. Kubai	96-052	Monterey Creek	1 ♂	24, 25
"	DM 96087	Leavitt Creek	1 ♂	26-29
"	DM 96084	Sonora Pass	4 ♂	30-32
"	"	"	1 ♂	33-35
"	"	"	7 ♂	36 →

Video TAPE #2 MCH

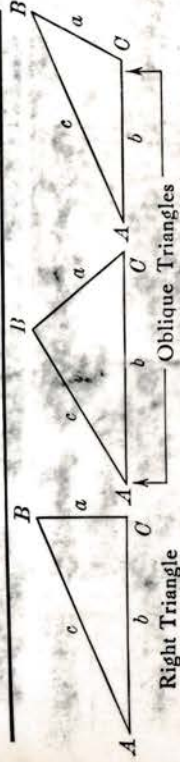
filmed 6-29	7-1:	Video Tape #2 MCH	7-1:
96-027	Mt. Pinos	H. americanus 1♂	weak
96-042	Mt. Ashland	H. bulbipes 1♂	numous ♀♀, decent?
96-052	Monitor Creek	Hef Kubzi 1♂	Bull River ♀ good-
96-055	Devil's Gsk	H. americanus 1♂	DAIF O.K.
"	"	" 3♂	" O.K.
96-059	White mtns	H. americanus 2♂	DAIF ♀ good-
96-067	Subway	H. americanus 5♂	DAIF ♀ good-
96-063	Mono Lake	H. tarsalis 1♂	DAIF ♀ good-
96-065	Fioga Pass	H. americanus 1♂	DAIF ♀ good-
96-076	Strawberry	H. americanus 1♂	DAIF ♀ good-
"	"	" 2♂	" O.K.
96-077	Chipmunk Flat	H. americanus 1♂	Bull River / DAIF good-
"	"	" 2♂	DAIF O.K. (bad leg)
96-091	0.8 mi W Sonora Pass	H. americanus 1♂	DAIF Bull River good-
			(missing 1st leg)

DEM 96084	Sonora Pass	Hef Kubzi 1♂	SPIR Bull River
"	"	2♂	DAIF O.K.
"	"	3♂	various O.K.
"	"	4♂	DAIF good-
"	"	5♂	DAIF good-
"	"	6♂	" nice-
"	"	7♂	" * like red
"	"	8♂	DAIF good-
"	"	9♂	" nice-
"	"	2♂	" good-
"	"	3♂	" nice-
"	"	4♂	" good-
96-074	N. Richesne River	H. americanus 1♂	made
96-07?	High Uintas	H. americanus 1♂	"
96-056	Mono Lake	H. tarsalis 1♂	DAIF good-
96-068	Mosca Pass	H. sansoni 1♂	DAIF very nice
END of TAPE #2			

H. pygmaethrix courtship 11/23/95
 Mark & Shelley's house 309 N. Park
 (face to face)

- Initial obs. ♂ ~ 2 cm from ♀. ♂ front legs elevated, flicked his tail, and then twinkled them down. Simultaneously, alternating 1st & 3rd leg shuffle (duration ~ 5 min)
- at some point - alternative display - both 3rd legs elevated. front legs rapidly waving and elevated, ♂ getting closer to the ♀.
- final stage (apparently), ♂ continued to hold both 3rd legs elevated, contacting ♀ w/ first legs on her 1st legs
- ♀ appeared to decline - pushed him away
- ♀ moved off, ♂ followed; but ♂ seemed to be out of visual range - must have following her silk or pheromones associated w/ silk.
- when ♂ approached to ~ 4 cm, went into a long distance, initial type of display, moving laterally (side to side) waving first legs, no obvious tarsal flicking - ♂ continued but ♀ uninterested
- total observation time: 20-25 minutes.

TRIGONOMETRIC FORMULAE



Solution of Right Triangles

For Angle A. $\sin A = \frac{a}{c}$, $\cos A = \frac{b}{c}$, $\tan A = \frac{a}{b}$, $\cot A = \frac{b}{a}$, $\sec A = \frac{c}{a}$, $\csc A = \frac{c}{b}$

Given a, b Required A, B, c

$\tan A = \frac{a}{b}$, $\cot B = \frac{b}{a}$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$

Given a, c Required A, B, b

$\sin A = \frac{a}{c}$, $\cos B = \frac{b}{c}$, $b = \sqrt{c^2 - a^2} = c \sqrt{1 - \frac{a^2}{c^2}}$

Given A, a Required B, b, c

$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$

Given A, b Required B, a, c

$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$

Given A, c Required B, a, b

$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given a, b, c Required A, B, C

$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$, $C = \cos^{-1} \left(\frac{a^2 + b^2 - c^2}{2ab} \right)$

Given a, b, C Required A, B, c

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$, $c = \frac{a \sin C}{\sin A}$

Given a, c, C Required A, B, b

$\frac{a}{\sin A} = \frac{c}{\sin C}$, $\sin A = \frac{a \sin C}{c}$, $A = \sin^{-1} \left(\frac{a \sin C}{c} \right)$

Given a, A, C Required B, b, c

$B = 180^\circ - (A + C)$, $b = \frac{a \sin B}{\sin A}$, $c = \frac{a \sin C}{\sin A}$

Given a, A, B Required C, c, b

$C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$, $b = \frac{a \sin B}{\sin A}$

Given a, b, A Required C, c, B

$\frac{a}{\sin A} = \frac{b}{\sin B}$, $\sin B = \frac{b \sin A}{a}$, $B = \sin^{-1} \left(\frac{b \sin A}{a} \right)$

Given a, b, B Required C, c, A

$\frac{a}{\sin A} = \frac{b}{\sin B}$, $\sin A = \frac{a \sin B}{b}$, $A = \sin^{-1} \left(\frac{a \sin B}{b} \right)$

REDUCTION TO HORIZONTAL

Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, Page IX, $\cos 5^\circ 10' = .9953$. Horizontal distance = $319.4 \times .9953 = 318.09$ ft. Horizontal distance also = Slope distance minus slope distance times $(1 - \cos \text{ of vertical angle})$. With the same figures as in the preceding example, the following result is obtained. $\cos 5^\circ 10' = .9953$. $1 - .9953 = .0047$. $319.4 \times .0047 = 1.51$. $319.4 - 1.51 = 317.89$ ft. When the rise is known, the horizontal distance is approximately: the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.