

NEWSLETTER
ARTHROPODS OF CANADIAN GRASSLANDS
 no. 2, 1984

EDITOR'S NOTES

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This is the second edition of the "Grasslands Newsletter" which is intended to serve as an open forum for the Grassland Arthropod Survey initiated by the Biological Survey of Canada (Terrestrial Arthropods). While last year's issue concentrated on the general nature of the grasslands survey project and on particular field sites, I am pleased to include in this issue information provided by people actually working on insects of Canadian grasslands. I hope that more of the readers of this rag will submit short pieces about their projects for next year's edition. Short, informal communications, pleas for help, sonnets in admiration of grasshoppers . . . we'll print 'most anything about grassland arthropods!

I have taken a break from the Scientific Committee for the Biological Survey and so Rob Cannings now sits in the chair of the Grasslands Subcommittee. Although I will be pleased to handle correspondence associated with this Newsletter, please direct other correspondence about the Grasslands Survey Mr. Rob Cannings, British Columbia Provincial Museum, 601 Bellville Street, Victoria, British Columbia V8V 1X4. Anyone wishing to be placed on the mailing list for this newsletter should contact Dr. H. V. Danks, Biological Survey of Canada (Terrestrial Arthropods), Invertebrate Zoology Division, National Museum of Natural Sciences, Ottawa, Ontario K1A 0M8.

PRAIRIE DOG TOWNS OF SOUTHERN SASKATCHEWAN

Valerie Behan-Pelletier, Biosystematics Research Institute,
 Agriculture Canada, Ottawa, Ontario K1A 0C6

The prairie dog towns of southern Saskatchewan are poorly known but extremely interesting collecting sites for terrestrial arthropods.

The black-tailed prairie dog, *Cynomys ludovicianus* (Ord.) is only found in its natural habitat in Canada south of Val Marie, a small town on the Frenchman River, 120 km south of Swift Current. In the future much of this area will form part of the Grasslands National Park which will encompass one of the most unique and rare natural habitats in Canada - the mixed grass prairie. Although an agreement was signed between the Federal and Provincial governments in 1981, paving the way for the establishment of the park, as of July 1983, no land had been purchased. As a result the prairie dog towns are on land partially owned by a local farmer and partially by the Natural

History Society of Saskatchewan.

The mixed grass prairie in this area is dominated by *Stipa comata*, *Bouteloua gracilis*, *Agropyron dasystachyum*, *Koeleria cristata* and *Poa sandbergii*. In the dog towns, however, *A. dasystachyum* is dominant, as a result of disturbance of the soil by the prairie dogs. Topographically the prairie dog town is a mosaic of borrows, about 8 to 16 m apart, with soil excavated from the burrows forming a mound 0.5 m high around the entrances. The prairie dogs themselves are very active during the day - feeding, grooming, taking dust baths and chasing prairie dogs from other colonies. The burrows, up to 5 m deep and 14 m long, the loosened mounds of soil and the disturbed prairie vegetation between burrows encompass a number of unique habitats for arthropods which are definitely worth examining.

According to A.W.F. Banfield (1974. The Mammals of Canada. U. of Toronto Press), the first dogtown in Canada was discovered in 1927, north of Val Marie. This was subsequently destroyed, but a second town was found south of Val Marie in 1929, which by 1937 included 280 hectares and contained an estimated 8,700 animals. By 1958 a total of 11 prairie dog towns had been reported in this area. The dog towns are most easily accessible through the property of Norm Kornfield whose farm is about 11 km south of Val Marie (Hwy 4 S., from Val Marie for ca. 4 km and when Hwy 4 swings W. take a gravel road S. for 7 km. Look for sign 'DOGTOWN' at entrance to Mr. Kornfield's property). The road through Mr. Kornfield's farm ends at a cairn erected by the Natural History Society of Saskatchewan noting the presence of the prairie dog town. A fenced-in area north of the cairn is owned by the Society and encloses active colonies, but the town now extends to the cairn and many, very vocal prairie dogs will sound the alarm with loud explosive barks and emphatic tail twitching at your approach.

For further information contact the Area Superintendent, Grasslands National Park, Val Marie, Saskatchewan, SON 2T0.

PEACE RIVER GRASSLANDS BUTTERFLY SURVEY

Ted Pike, Box 1231, Fairview, Alberta, T0H 1L0 and
Felix Sperling, Department of Entomology, University of Alberta,
Edmonton, Alberta, T6G 2E3

Patches of remnant natural grassland can be found in the Peace River region between Wood Buffalo Park, Fort St. John and Grande Prairie. Two prairie community types are predominant; a *Stipa spartea* var. *curtiseta* - *Carex* ssp. - *Artemisia frigida* community on steep, south- or west-facing slopes, and a more widespread *Danthonia intermedia* - *Stipa spartea* var. *curtiseta* community on Solonchic soils (K. Wilkinson 1981, M.Sc. thesis, University of Calgary). These communities may include such species as *Opuntia fragilis* and *Lomatium foeniculum*, which give them a definite prairie character despite being surrounded by

more typical parkland. The most extensive grassland areas are along river banks between Fairview and Peace River, and also the north side of Grande Prairie. Several small Natural Areas and Ecological Reserves have been proposed or established on these areas by the Alberta Department of Energy and Natural Resources, including one on the Kleskun Hills badlands.

We have been surveying the butterfly fauna of the Peace River region for several years, including an intensive local survey by T. Pike near Fairview (unpublished). At least eight of the approximately 70 species in the region are restricted to grassland communities and are presently isolated by several hundred km from similar communities in southern Alberta. Pollen cores from central Alberta suggest this isolation has been maintained since the termination of a dry climatic period about 6000 BP (C. Schweger and T. Habgood 1981, Proc. Alta. Climat. Associ.). Some of the grassland-restricted species show definite phenotypic differentiation with respect to southern populations of the same species, which also suggests an extended period of isolation.

The fauna of the Peace River grasslands is relatively poorly known, and yet there is considerable promise for research on the effects of isolation in such patchy communities, and the extent to which their composition has been altered by northern faunal elements. People with interests in grassland Lepidoptera may wish to attend the 35th annual Lepidopterists Society meetings, to be held this year on July 5-8 in Fairview. T. Pike is a permanent resident of the town, and is organizing a field trip of the area after the meetings. He is willing to try to collect other local insect taxa for those with specific research interests.

ARTHROPODS IN DESERTED HAYFIELDS IN EASTERN ONTARIO

R. Harmsen, Department of Biology, Queen's University, Kingston, Ontario K7L 3N6

A long term project was initiated in 1975 in a couple of hayfields near Chaffey's Locks in Eastern Ontario. The site was purchased by Queen's University and the predominantly *Phleum-Trifolium* hayfields have not been cut or treated since the beginning of the project.

The project studies the succession of the entire community, and the effects of insect grazing on plant succession. One of the spin-offs of the project is a vast collection of samples of arthropods (27 permanent plots X 10 annual samples X 9 years, so far) swept out of the vegetation. As the samples are being sorted to the level of higher taxa, such collections will become available for taxonomic or zoogeographical research.

Anyone wishing to receive, from time to time, certain groups (e.g. ants, spiders, heteropterans) is welcome to the material. All specimens are in 70% alcohol. All I want in return is a list

of how many of what, and perhaps a couple of identified specimens of the quantitatively important species for our reference collection.

So far, we have produced one paper from this project: McBrien, H., R. Harmsen and A. Crowder. A case of insect grazing affecting plant succession. *Ecology* 64: 1035-1039. It deals with the effects of a Chrysomelid beetle on goldenrod, and indirect effects on the *Phleum-Poa-Agropyron* component of the community (reprints available).

GRASSLAND ARACHNIDS

R.G. Holmberg, Athabasca University, 15015-123 Avenue, Edmonton, Alberta, T5V 1J7

1. *Distribution of Solpugids of Canada*

Don Buckle (Saskatoon), Martin Muma (Arizona) and I are examining the distribution of this arachnid order in Canada. Specimens have been collected from the arid regions of the Okanagan Valley of B.C., southeastern Alberta and southwestern Saskatchewan. They may also occur in southern Manitoba. Their taxonomy is difficult. Mature males are necessary for reliable identification but, of course, most of the (few) collections made are immatures or females. If anyone has specimens, we would greatly appreciate borrowing them. A descriptive "Wanted Poster" is available on request.

2. *Biology of the Opilionid Homolophus biceps*

With the help of James Cokendolpher (Texas), I am examining the taxonomy, distribution and life cycle of this harvestman. *Homolophus biceps* is found throughout much of western North America and can be fairly common in prairie habitats - especially along the margins of sloughs and streams. This species, along with *Phalungium opilio*, will comprise the bulk of any harvestmen collections made in grassland study sites. If anyone wishes to have harvestmen identifications made, I will be glad to help.

RESEARCH ON SANDHILL INSECT BIOGEOGRAPHY

John H. Acorn, Department of Entomology, University of Alberta, Edmonton, Alberta, T6G 2E3

As part of a Masters program at the University of Alberta, I will be undertaking a study of the insect fauna of sand dune areas in the prairie provinces. The primary objective of this study will be biogeographic, and centers around the question of how both present ecological factors, and historical constraints have shaped the present distributions of sand dune insects. The study will focus on the carabid beetles, but other dune insects will be included in the initial survey as well, in an attempt to get a better general understanding of dune faunas.

Information on particular dune areas, and directions for gaining access to them would be appreciated. As well, collecting records, or loan of specimens from dune areas would also be of help, as would the names of dune-loving species in groups other than carabid beetles.

OUR BEEF AND GRASSLAND BEETLES

John R. Spence and Nora Berg, Department of Entomology,
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During 1983 pitfall traps were run in section 28 at the University of Alberta Ranch at Kinsella, Alberta. The main objective of the study was to compare the carabid faunas from 4 different kinds of grasslands located in close proximity. Pitfall grids were established in areas dominated by (1) *Agropyron-Stipa*, (2) *Festuca*, (3) *Bromus*, and (4) a complex vegetative mixture of grasses, herbs and shrubs. Areas 1 and 2 were natural sites characteristic of the grassland portion of aspen parkland in eastern Alberta. Areas 3 and 4 were disturbed by activities of man. Area 3 was a product of recent succession from bare ground created in association with pipeline construction while area 4 was under heavy (June-September) grazing pressure from domestic cattle. Only area 4 had been affected by livestock for at least the past 35 years. Sweep net samples were taken bi-weekly on the trapping grids and in July microarthropod samples were collected by Dr. V. Behan-Pelletier of the Biosystematics Research Institute.

Samples are still being processed but we will not let that prevent us from making a few tentative observations based on a gross overview of the pitfall trap captures. First, surprisingly few carabids were collected from any of the ungrazed sites. Results of general collecting by several roving teams of mosquito-covered carabidologists also suggest that ground beetle faunas in the Kinsella area are indeed richest in grazed areas. Ants were the dominant predatory arthropods in the ungrazed areas. These observations suggest that there may be a complex interaction among large domestic herbivores, ants and ground-beetles and that, in addition to having well known effects on composition of vegetation, grazing might also affect the composition of predatory arthropod assemblages. Because a number of workers have suggested a negative interaction between ants and carabids, it is interesting to speculate that domestic livestock may be able to affect the outcome of such interactions.

There were also rather dramatic differences in species composition between grazed and ungrazed areas. For example, large bodied carabid species (*Carabus taedatus* and *Calosoma moniliatum*) were relatively common early in the season in the grazed area but were rare in all 3 ungrazed sites. Conversely, small bodied species (eg. *Dischirius dentiger* and *Metabletus americanus*) were commonly collected in the ungrazed areas but apparently absent from the grazed pitfall grid. Although there appear to be

significant differences between assemblages from grazed and ungrazed grassland, no difference is apparent between the faunas collected from ungrazed areas despite large differences in composition of vegetation.

HELP! A large problem encountered in this study was that cattle enjoyed playing with our traps. Single traps were infrequently disturbed, especially when guarded by a dome of iron rods. However, as soon as traps were placed in regular grids, the cattle delighted in digging them up and kicking them about. If this problem can be overcome in a way that does not remove the effects of grazing in grazed habitats, continued investigation of these ground-beetle assemblages promises to be interesting. Any suggestions will be greatly appreciated. If your suggestion works, we shall be happy to send you, upon request, all of our unidentified acalyptrate flies, or 25 domes of tubular iron good for a perverse game of croquet.

B.C. GRASSLAND PROJECT - 1983

Robert A. Cannings, Curator of Entomology, B.C. Provincial Museum, Victoria, British Columbia V8V 1X4

The lack of a provincial budget in B.C. during the early months of the 1983-84 fiscal year prevented me from travelling to my grassland study sites before mid-August. The planned documentation of plant communities at Okanagan sites (Chopaka, Osoyoos, Vernon), best done in May and June, had to be postponed. This botanical work, to be done with the help of Provincial Museum botanists Bob Ogilvie and Adolf Ceska, will be attempted in May 1984.

Present work centers on the Asilidae (Robber Flies) of the B.C. interior grasslands. A moderate amount of collecting was undertaken at the Osoyoos and Chopaka sites in September. At Chopaka the genus *Mallophorina* was collected in Canada for the first time.

The genus *Efferia* is a dominant one in the grasslands of southern Canada. Because it is the most diverse genus in the grasslands of B.C., I am concentrating my efforts on it. I am especially interested to see if various species show a preference for different plant associations or soil types. Since Wilcox (Proc. Calif. Acad. Sciences 34: 85-234, 1966) in his monograph on the genus considered virtually no Canadian material, I plan to analyse the genus in all Canadian grasslands. There are seven species in B.C. and eleven in Canada.

Associated with the sage-dominated clayey soil at Chopaka are only two species of *Efferia*, both widespread taxa - *E. benedicti* and *E. harveyi*. The flight period of the former is mostly complete by the end of July while that of the latter

begins about mid-August. Both are extremely abundant at this site. Females of *E. harveyi* were still ovipositing on 23 October, although no other asilids were present.

In the sandy, more acid soil of the extreme southern Okanagan, represented by the Osoyoos site and dominated by antelope brush (*Purshia tridentata*), the most interesting species are *Efferia albibarbis* and *E. n.sp.* *Efferia albibarbis* is found in B.C. only here; its only other locality in Canada is Point Pelee, Ontario. The new species, found in large numbers for the first time this year, is most closely related to *E. coulei*, a spring species common in cooler grassland sites dominated by bunchgrass (*Agropyron spicatum*) and rabbitbrush (*Chrysothamnus nauseosus*). *E. coulei* is common as far as north as the Chilcotin Region in central B.C.

The three most common species on the Great Plains are the closely-related *E. bicaudata*, *E. frewingi* and *E. helenae*. The only species abundant in the East Kootenay area of B.C. is also *E. frewingi*.

Many other robber fly species have been collected on B.C. grasslands. These species are included in a growing annotated list of the Asilidae of B.C. that will summarize the taxonomy, distribution and ecology of the fauna.