

# Distinguishing adults of *Bracon cephi* and *Bracon lissogaster* (Hymenoptera: Braconidae), parasitoids of the wheat stem sawfly (Hymenoptera: Cephidae)<sup>1</sup>

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*The Canadian Entomologist* 133: 215 – 217 (2001)

The wheat stem sawfly, *Cephus cinctus* Norton (Hymenoptera: Cephidae), has been the most economically important insect pest of wheat in the northern Great Plains since cultivation began (Weiss and Morrill 1992). The wheat stem sawfly was first reported from wild grasses where populations were often highly parasitized by a number of parasitoids, including *Bracon* (= *Microbracon*) *cephi* (Gahan) (Hymenoptera: Braconidae) (Criddle 1923; Ainslie 1929). A similar species, *Bracon lissogaster* Muesebeck, was later reported to also attack *C. cinctus* larvae (Muesebeck 1953; Somsen and Luginbill 1956). These parasitoids are now prevalent in wheat in some regions of Montana (Morrill *et al.* 1994, 1998; Morrill 1997). The life histories and phenologies of these sympatric idiobiont ectoparasitoids are similar. The ability to distinguish *B. cephi* from *B. lissogaster* is essential in elucidating their effects on populations of *C. cinctus*. We examined 159 females and 123 males of *B. cephi* from Chouteau, Hill, Stillwater, Teton, and Toole counties in Montana; Burke, Burleigh, Rolette, and Williams counties in North Dakota; Rock County in Minnesota; and southern Alberta (Rockyford and Consort). The 254 females and 215 males of *B. lissogaster* examined were from Chouteau, Hill, Teton, and Toole counties in Montana. Holotypes were compared to verify identifications. Terminology used follows that of Wharton *et al.* (1997). Voucher specimens (5 males and 5 females of both species) have been deposited in collections at Texas A&M University, College Station, Texas, and Montana State University, Bozeman, Montana. A set of four morphological characters allows for speedy separation of males and females of the two species (Table 1). It is not possible to separate the species using body size. The metasomal sculpturing is best seen when viewed from the side using a diffuse light source. Body color is variable and must be used with caution. *Bracon cephi* males and females are usually yellowish-orange; however, some have the head and thorax darker, especially smaller specimens. *Bracon lissogaster* males generally have a black head and thorax, with the metasoma yellowish-orange. *Bracon lissogaster* females are yellowish-orange with a black head.

*Bracon cephi* is recorded from Alberta, Saskatchewan (Nelson and Farstad 1953), Manitoba, North Dakota (Gahan 1918), British Columbia, Iowa, Kansas, Minnesota, Montana, Nebraska, South Dakota, Wyoming, and southwest United States (Krombein *et al.* 1979). In Montana it occurs east of the Rocky Mountain Front Range. *Cephus cinctus* is the only known host.

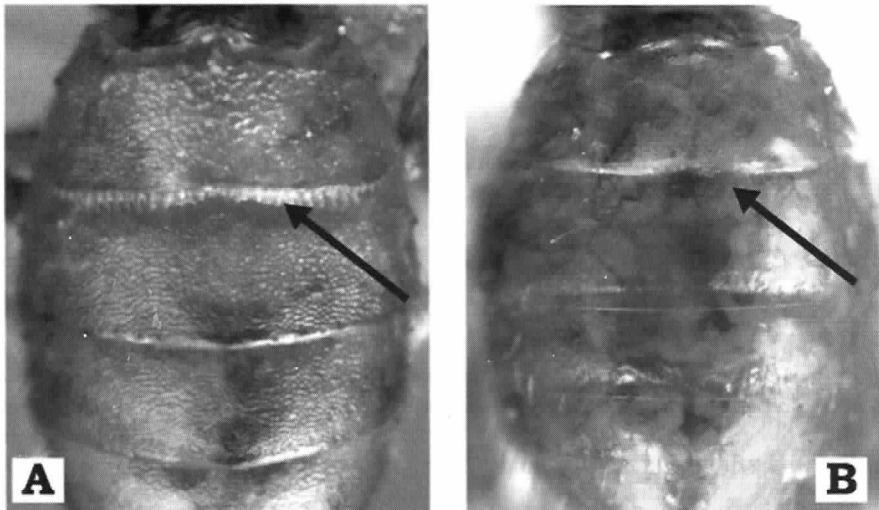
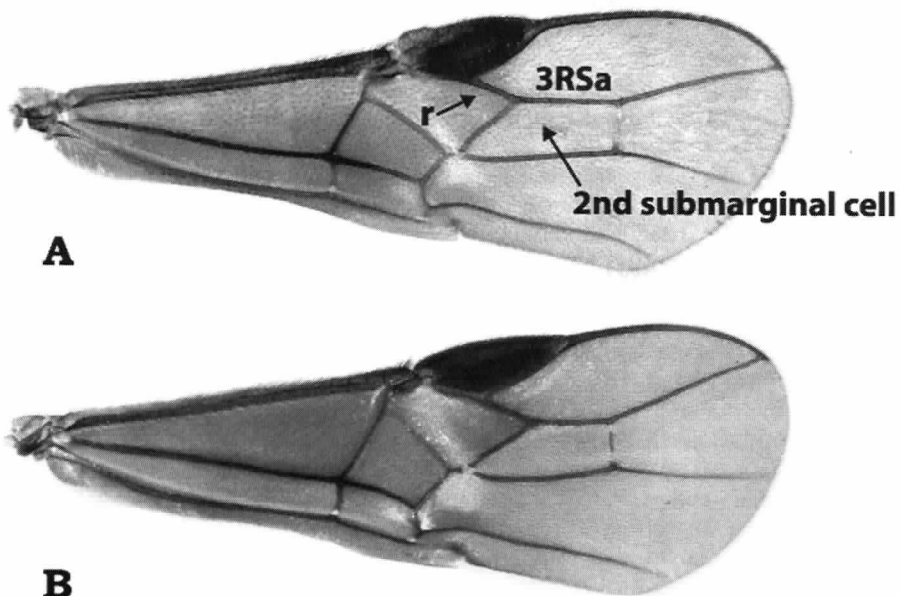
*Bracon lissogaster* is found in the north-central Montana counties of Cascade, Chouteau, Glacier, Hill, Liberty, and Pondera (Somsen and Luginbill 1956), and of Teton and Toole (Muesebeck 1953). It was released and has become established in south-central Montana (Morrill *et al.* 1998). *Cephus cinctus* is the only known host.

<sup>1</sup> Contribution No. V-2000-68 of the Montana Agricultural Experiment Station.

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TABLE 1. Distinguishing characteristics of *Bracon cephi* and *Bracon lissogaster*.

Character	<i>Bracon cephi</i>	<i>Bracon lissogaster</i>
Surface texture of metasoma	Finely granular (Fig. 1A)	Smooth and polished (Fig. 1B)
First metasomal suture	Crenulate (Fig. 1A)	Fine, margined by a weakly sinuate ridge (Fig. 1B)
Origin of vein <i>r</i>	Near middle of stigma (Fig. 2A)	Before middle of stigma (Fig. 2B)
Second submarginal cell	Long (ratio of 3RSa to <i>r</i> between 2.0 and 3.0) (Fig. 2A)	Short (ratio of 3RSa to <i>r</i> between 1.0 and 2.0) (Fig. 2B)

FIGURE 1. Metasomal terga of (A) *Bracon cephi* and (B) *Bracon lissogaster*. Arrows indicate first metasomal suture.FIGURE 2. Forewings of (A) *Bracon cephi* and (B) *Bracon lissogaster*. *r*, radial cross vein; 3RSa, basal segment of the third abscissa of the radial sector.

We are grateful to Robert A Wharton (Texas A&M University) for suggestions of useful characters and comments on the manuscript; Joe Giersch for help with preparation of the figures; David R Smith and Cathy Anderson of the Smithsonian Institution for loan of type material; and Kevin O'Neill, Xinzhi Ni, and Matt Grieshop for reviewing the manuscript.

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(Received: 2 August 2000; accepted: 14 November 2000)