**Diagnostic characters:**

Median has 3 teeth, the central tooth being very tiny and not always visible. 5 laterals. Head capsule elongate and light in color, mentum perched.

Ecology:

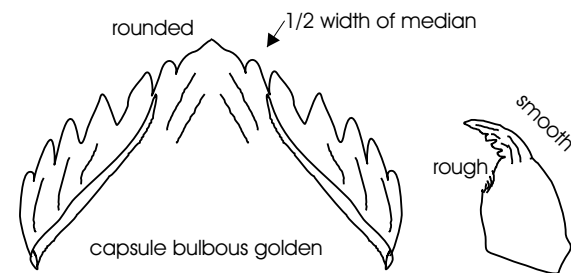
Subfossil: Insufficient data.

Organism: One species, ?*C. scutellata* recognized in New Zealand by Boothroyd and Forsyth (2007) occurring in dung in grasslands. Forsyth (1971) described *C. donovani* larvae as highly active, browsing upon algae growing on the substrate in clear, well-aerated, slow streams. The larvae did not live in tubes and were capable of rapid darting movements across the substrate, but only became free swimming when persistently irritated.

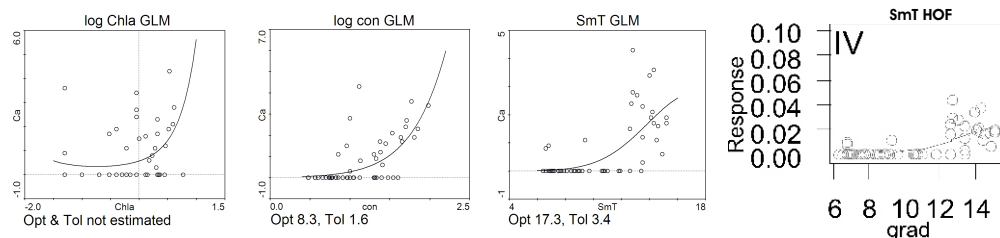
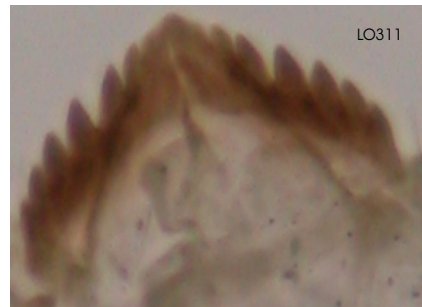
Lakes containing taxon: None found in Dieffenbacher-Krall et al. (2007) sites. Found in recounted Woodward and Shulmeister (2006) site Howden. Low amounts found in Woodward and Shulmeister (2006) sites that have not been recounted, Dudding, Glen, Johnson, Mistletoe, Rerewhakaaitu, Rotorua S, Rotorua N.

Cricotopus aucklandensis

Orthoclaadiinae



After Boothroyd 1989.



Diagnostic characters:

Median is single, rounded or peaked. 6 laterals. 1st lateral is about $\frac{1}{2}$ the width of the median. Note smooth outer edge and rough inner edge of mandible.

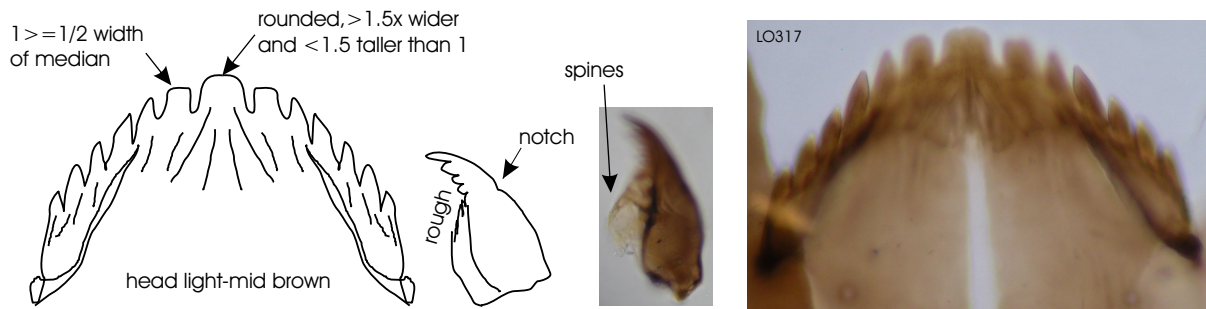
Similar taxa: Can be difficult to distinguish from other *Cricotopus* species and *Paratrichocladius*, but *C. aucklandensis* is by far the most common. *C. planus* has a rounded median more than 1.5 wider and less than 1.5 taller than 1st lateral, 1st lateral width is greater than or equal to $\frac{1}{2}$ the median width, mandible has a notch on outer edge. *Paratrichocladius* teeth are uniformly dark, outer edge of mandible is bumpy and inner edge is smooth. *C. zealandicus* median is rounded and taller than 1st lateral, 1st lateral width is greater than or equal width of median, no notch on outer edge of mandible. *C. hollyfordensis* median is rounded, median is less than 1.5 wider and more than 1.5 taller than 1st lateral, 1st lateral width is greater than or equal to width of median, notch on mandible outer edge. *C. vincenti* median is slightly flattened, 1st and 2nd laterals partially fused with median, mandible is heavily sclerotized.

Ecology:

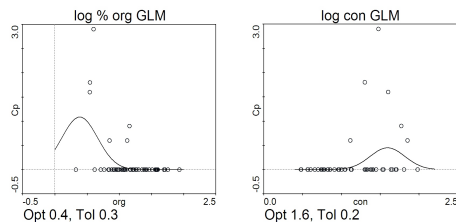
Subfossil: *C. aucklandensis* occurred in greatest abundance in warmer sites (>12 °C mean summer temperature), and tolerates conductivity at the higher end of the range represented by Dieffenbacher-Krall et al. (2007) lakes. Woodward and Shulmeister (2006) noted it to be characteristic of warm temperatures (mean February temperature > 13 °C), as having a fairly wide trophic tolerance with its optimum at the oligotrophic-mesotrophic transition, and as being somewhat restricted to lower altitudes but remaining a component of the fauna up to 1300 m a.s.l.

Taxonomic references: Boothroyd 1989, 1990, and 2002.

Lakes containing taxon: Dieffenbacher-Krall (2007) sites 201, 202, 205-211, 213-215, 217, 218, 301-304, 308, 310, 311, 319, 323, 326, 327, 401, 403-407, 416, 419, 423, 501. Recounted Woodward and Shulmeister (2006) sites Howden, Harris, Sylvan, Emma, Little Sylvester, Sedgemere, Sylvester.



After Boothroyd 1990.



Diagnostic characters:

Median is single and rounded, greater than 1.5 times wider and less than 1.5 times taller than 1st lateral. 6 laterals. 1st lateral is greater than or equal to 1/2 the width of the median. Note notched outer edge and rough inner edge of mandible.

Similar taxa: Can be difficult to distinguish from other *Cricotopus* species and *Paratrichocladus*, especially *C. zealandicus*. *C. aucklandensis* has a rounded or subtrifid median, 1st lateral width about 1/2 the median width, mandible not notched on outer edge. *Paratrichocladus* teeth are uniformly dark, outer edge of mandible is bumpy and inner edge is smooth. *C. zealandicus* median is rounded and taller than 1st lateral, 1st lateral width is greater than or equal width of median, no notch on outer edge of mandible, 1st lateral to median width ratio is smaller than that of *C. planus*. *C. hollyfordensis* median is rounded, median less than 1.5 wider and more than 1.5 taller than 1st lateral, 1st lateral width is greater than or equal to width of median, notch on mandible outer edge. *C. vincenti* median is slightly flattened, 1st and 2nd laterals partially fused with median, mandible is heavily sclerotized.

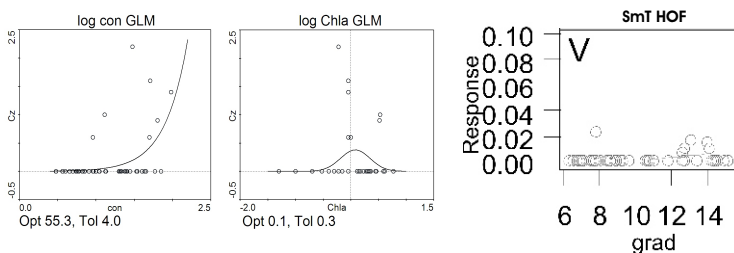
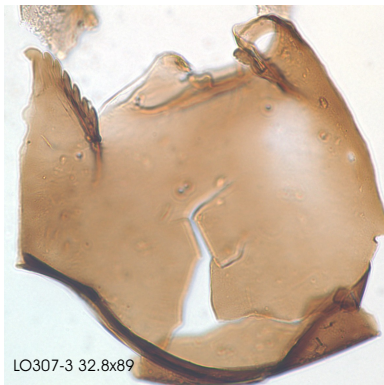
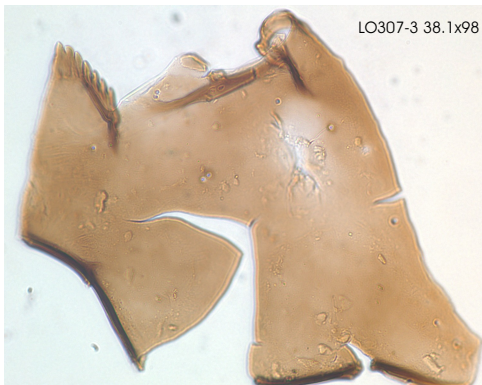
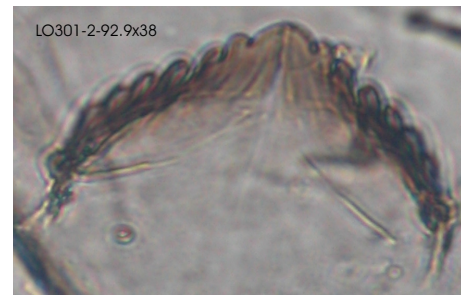
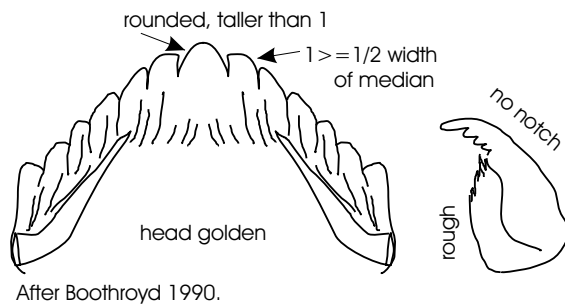
Ecology:

Subfossil: Not abundant in Dieffenbacher-Krall et al. (2007) sites, but found mostly in lakes with lower sediment organic content (LOI).

Organism: Larvae found in riffle areas of fast flowing streams, rarely in pools, building tubes from algae and detritus (Boothroyd 1990).

Taxonomic references: Boothroyd 1990 and 2002.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 302, 315-317, 323, 326.



Diagnostic characters:

Median is single and rounded. 6 laterals. 1st lateral is greater than or equal to $\frac{1}{2}$ the width of the median. Note outer edge of mandible is smooth and inner edge is rough.

Similar taxa: Can be difficult to distinguish from other *Cricotopus* species and *Paratrichocladius*, especially *C. planus*. *C. aucklandensis* has a rounded or subtrifid median, 1st lateral width about $\frac{1}{2}$ the median width, mandible not notched on outer edge. *Paratrichocladius* teeth are uniformly dark, outer edge of mandible is bumpy and inner edge is smooth. *C. planus* median is rounded and less than or equal to 1.5 times the height of 1st lateral, and greater than 1.5 times the width of 1st lateral, notch on outer edge of mandible. *C. hollyfordensis* median is rounded, median less than 1.5 wider and more than 1.5 taller than 1st lateral, 1st lateral width is greater than or equal to width of median, notch on mandible outer edge. *C. vincenti* median is slightly flattened, 1st and 2nd laterals partially fused with median, mandible is heavily sclerotized.

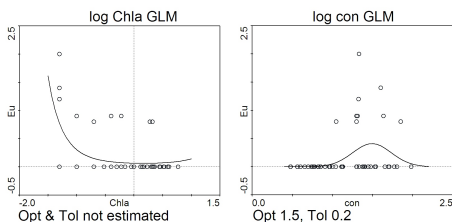
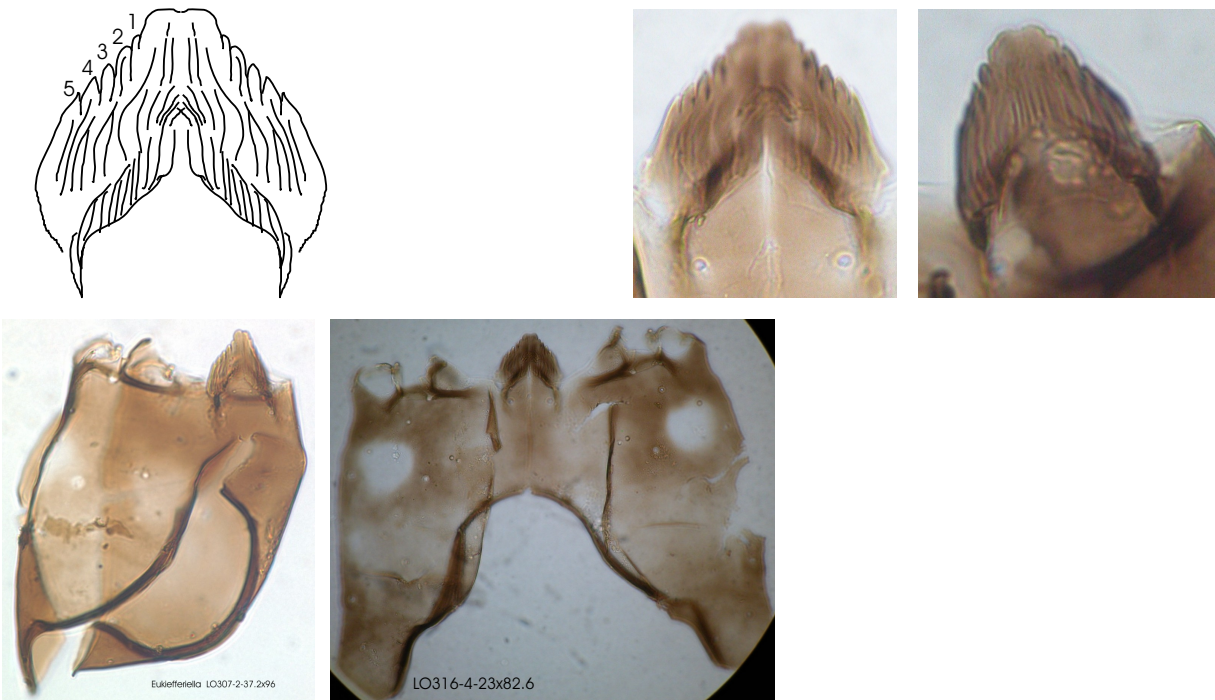
Ecology:

Subfossil: Not abundant in Dieffenbacher-Krall et al. (2007) sites. Woodward and Shulmeister (2006) described it as characteristic of warm temperatures (mean February temperature $> 13^\circ\text{C}$).

Organism: Boothroyd (2002): Multivoltine, present throughout the year as larvae, pupae, and adults. Larvae form tubes of detritus and plant material on hard surfaces within fast flowing streams.

Taxonomic references: Boothroyd 1990 and 2002.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 207, 301, 303, 317, 323, 423. Woodward and Shulmeister (2006) recounted sites Emma, Little Sylvester, Sedgemere.



Diagnostic characters: Distinctive “perched” mentum. Single broad median indented. 5 laterals descending in size. Mentum highly sclerotized. Head capsule dark with prominent eyespots.

Ecology:

Subfossil: Appears to have significant relationships with conductivity and chlorophyll a.

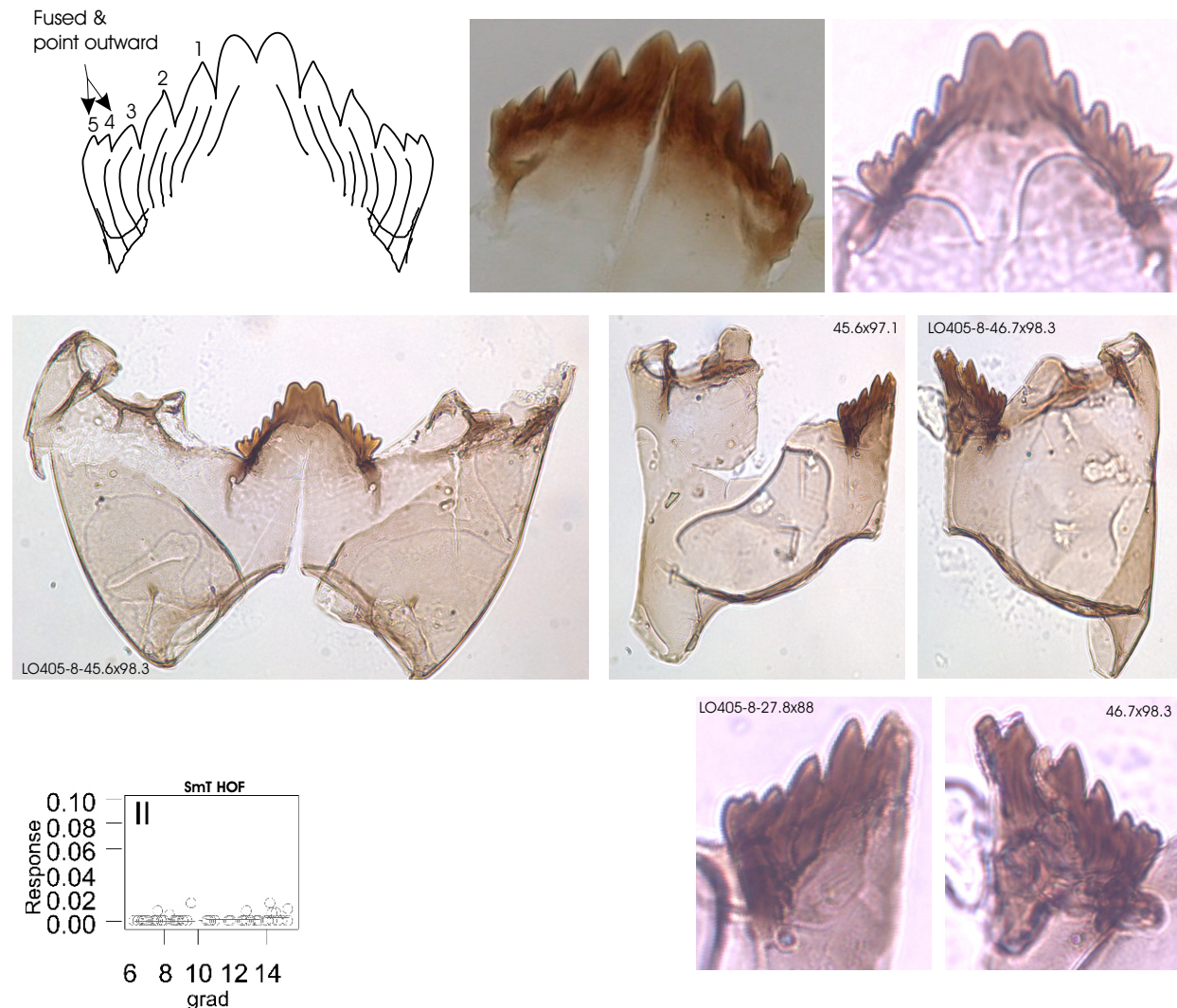
Organism: Winterbourn et al. (2000): *E. brundini* is widely distributed in NI rivers and streams. *E. insolida* is found in NI and SI rivers and streams. Reported from Australia to be tolerant of organic enrichment. An unidentified species is found in highly acidic coal mine drainages in Westland.

Boothroyd and Forsyth (2007) note several species in New Zealand: *E. brundini*, ?*E. commensalis*, *E. heveli*, and two unnamed *E. n. spp.*, all freshwater. Stark and Winterbourn (2006) note that there are at least 5 species and that abrasion of the mentum by feeding can obscure small differences in shape. Undescribed species are found in highly acidic, coal mine drainages, and living commensally on mayfly larvae (Stark and Winterbourn 2006).

In a study of chironomid larval head capsules in two glacier-fed rivers in SI, *E. brundini* was collected at all sites and was the most abundant invertebrate close to glacier margins in these two rivers (Milner et al. 2001).

Taxonomic references: Boothroyd and Cranston (1995) described *E. brundini* mentum as broader than *E. insolida* mentum with a somewhat bulbous median, and *E. insolida* as having a more tapering, narrower median. Based on Boothroyd and Cranston (1995) sketches, ours are closest in appearance to *E. brundini*. We have not noted subfossil heads similar in appearance to *E. insolida* and are uncertain how distinct *E. brundini* and *E. insolida* might be in subfossil material.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 211, 307, 308, 316, 411, 419 - not occurring in high abundance in any samples. Recounted Woodward and Shulmeister (2006) sites Sylvan, Little Sylvester, Rainbow Skifield E.



Diagnostic characters:

Double median is large, 5 laterals. Laterals 4 and 5 are fused and 5 points outward. Designation may represent several different taxa.

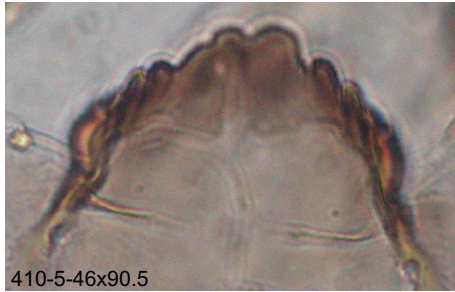
Similar to Genus nr. *Gymnometriocnemus* of Cranston 2000. We are not entirely certain that all types grouped here in our classification are actually *Gymnometriocnemus*.

Ecology:

Subfossil: Insufficient data.

Organism: One species known from freshwater sites in New Zealand, *G. lobifer* (Boothroyd and Forsyth 2007).

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 211, 316, 322, 323, 404, 405, 406, 412, 501, 324 reference. Recounted Woodward and Shulmeister (2006) sites Gertrude Saddle/Black, Howden, Mackenzie.



Diagnostic characters:

Double median is wide and rounded, 4 laterals.

We are not entirely sure that these are *Hevelius*.

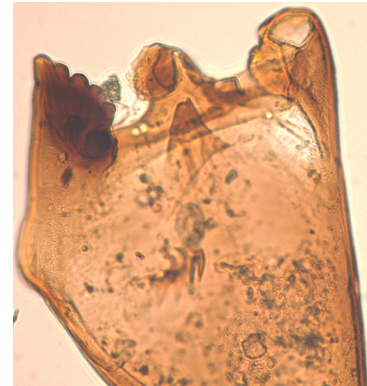
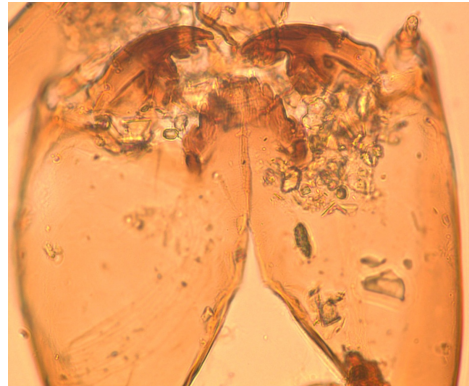
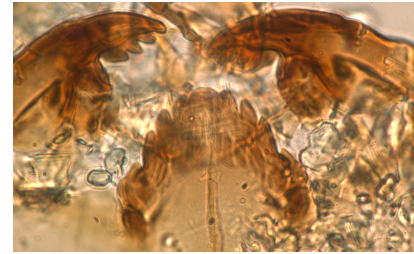
Ecology:

Subfossil: Insufficient data.

Organism: One species, the endemic *H. carinatus*, is known only from New Zealand subantarctic islands (Boothroyd and Forsyth 2007, Boothroyd unpub.)

Taxonomic references: Boothroyd (unpub.).

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 410, 413, 501. Recounted Woodward and Shulmeister (2006) sites Gertrude Saddle/Black, Mackenzie.

**Diagnostic characters:**

Single broad median, 4 laterals with large gap between laterals 1 and 2. VMPs are plate-like lobes, strongly bearded. Mentum is dark and heavily sclerotized. Mandible has a swollen mola.

Similar taxa: Nr. *Kaniwhaniwhanus* is very similar but curls inward at outer edge of mentum, and mandible has swollen 3rd tooth. We are not entirely confident that we can differentiate *Kaniwhaniwhanus* and Nr. *Kaniwhaniwhanus*, particularly in the absence of mandibles.

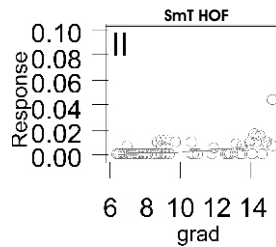
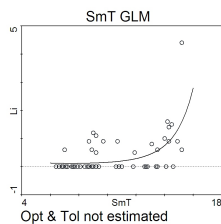
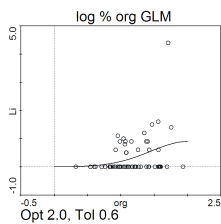
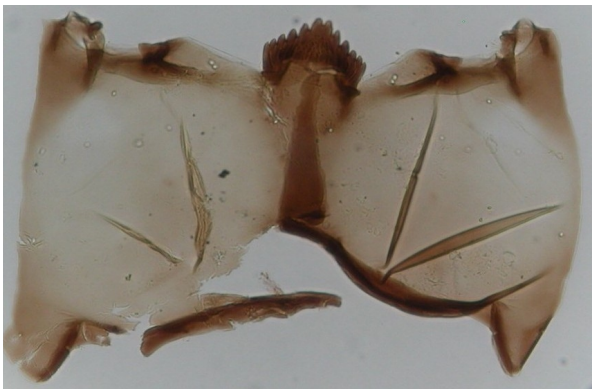
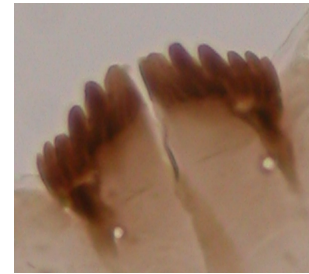
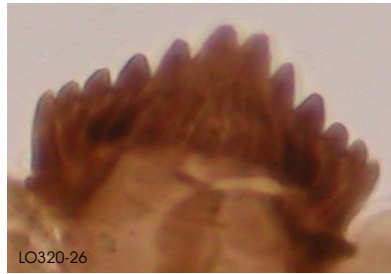
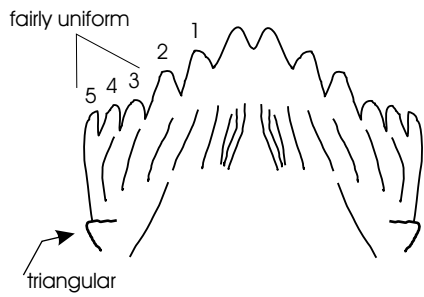
Ecology:

Subfossil: No data.

Organism: Single species, the endemic *K. chapmani*, found infrequently in streams, rivers, and lakes throughout New Zealand, where it may be locally abundant (Boothroyd unpub., Boothroyd and Forsyth 2007).

Taxonomic references: Boothroyd (1999a) contains descriptions of mentum and mandibles.

Lakes containing taxon: None found in Dieffenbacher-Krall et al. (2006) sites. Recounted Woodward and Shulmeister (2006) sites Sylan and Rainbow Skifield West.



Diagnostic characters:

Double median, 5 laterals. Laterals 3-5 are fairly uniform in size but smaller than laterals 1 and 2, dark triangle below 3 outer teeth.

Ecology:

Subfossil: Generally found in warmer sites with high sediment organic content.

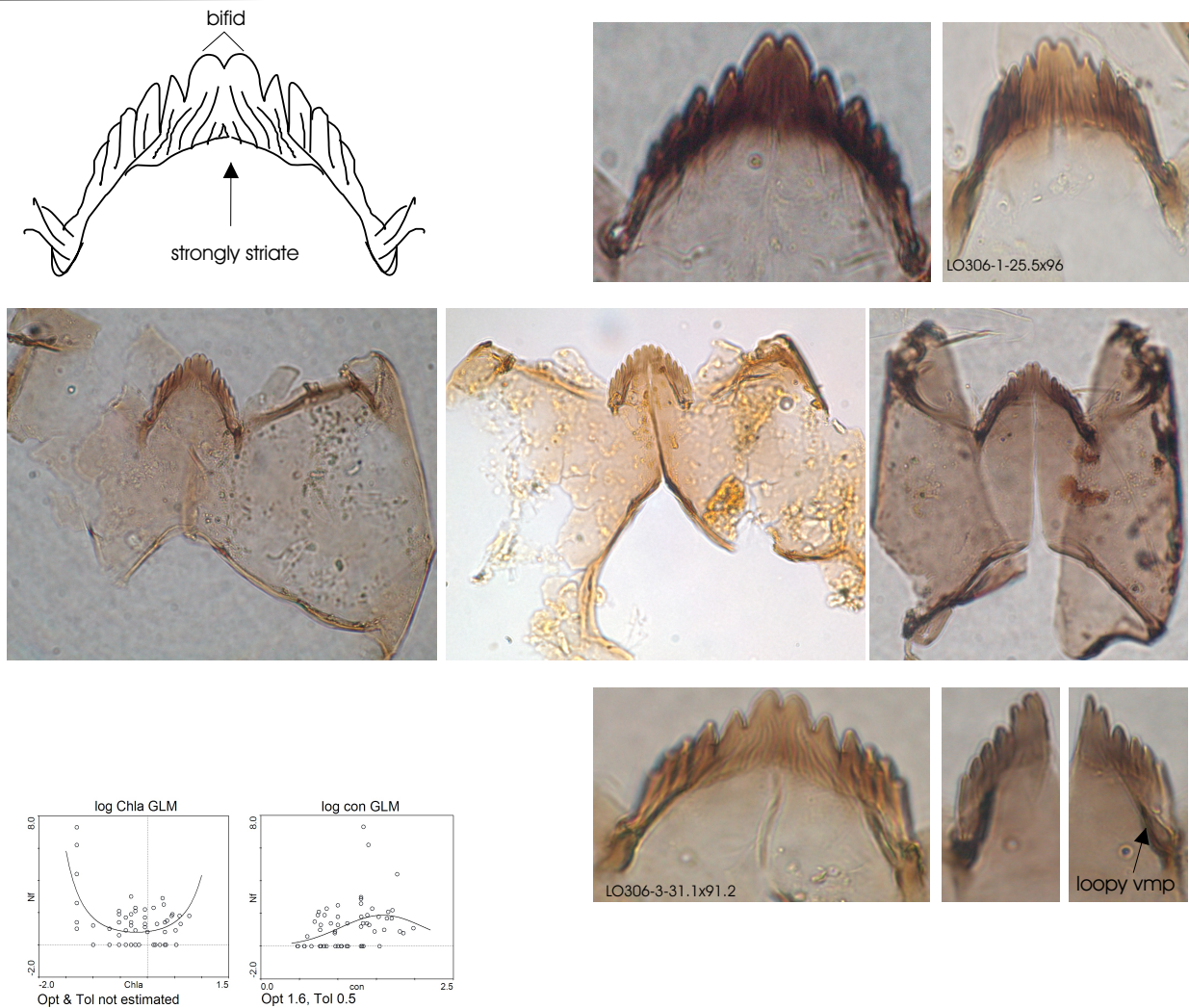
Organism: One species of *Limnophyes*, *L. vestitus*, known from new Zealand (Boothroyd and Forsyth 2007).

Taxonomic references: Possibly the Orthoclaadiinae I (*sensu* Boothroyd unpub.) of Woodward and Shulmeister (2006).

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 207, 208, 209, 319, 320, 322, 324, 326, 327, 401, 404 (abundant), 405, 406, 410, 411, 414, 501, 502, 507, 508. Recounted Woodward and Shulmeister (2006) sites Gertrude Saddle/Black, Harris, Sylvan, Little Sylvester, Sedgemere, Rainbow Skifield West.

Naonella forsythi

Orthoclaadiinae



Diagnostic characters:

Median bifid, 5 laterals. Teeth lie along a curved plane. Median and 1st lateral may be lighter in color than other laterals, and are strongly sclerotized. VMP fairly prominent, loop-like, bearded although hair is seldom visible.

Similar taxa: *Naonella kimihia* is similar with less prominent VMP and teeth on a level or nearly level plane. May be difficult to distinguish from curved *N. kimihia*, but watch for more prominent VMP in *N. forsythi*. *Naonella* type 419 is very similar but has larger, looped VMP with much hair, and head is usually dark with prominent eyespots. *Naonella* type 305 is a lighter head with median and 1st laterals perched on a higher plane than other laterals.

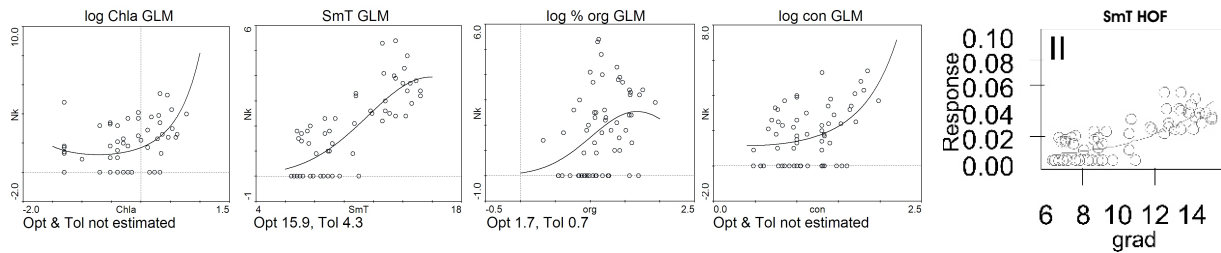
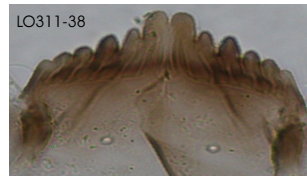
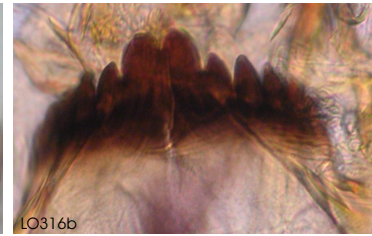
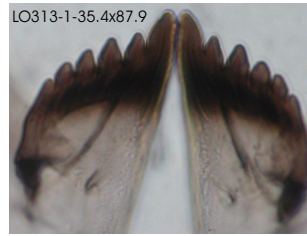
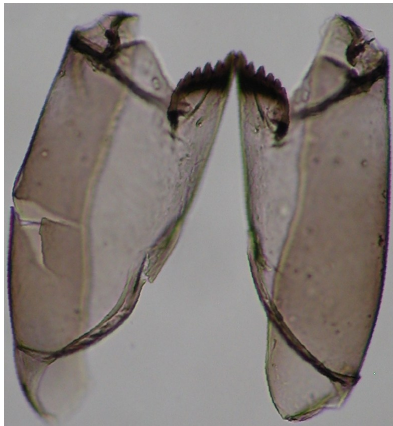
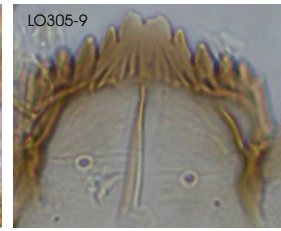
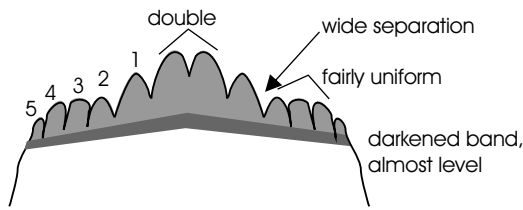
Ecology:

Subfossil: Fairly ubiquitous, less strongly linked with temperature than *N. kimihia*.

Organism: Endemic to New Zealand.

Taxonomic references: Boothroyd 1994, 2004

Lakes containing taxon: 47 Dieffenbacher-Krall et al. (2007) sites. 12 of 15 recounted Woodward and Shulmeister (2006) sites.



Diagnostic characters:

Double median, 5 laterals, with teeth usually even in color. Teeth lie on a level plane, or only slightly curved. Generally a dark band is visible along bottom of teeth. Deep separation between laterals 1 and 2, laterals 2-4 even in size, lateral 5 smaller. In degraded samples, median and 1st laterals may look like a single broad median with notches. Here the uniformity of laterals 2-4 may be the strongest identification clue.

Similar taxa: *Naonella forsythi* is often quite similar but mentum is more curved. Half heads are often difficult to differentiate. It may be difficult to distinguish between a slightly curved *N. kimihia* and *N. forsythi*. VMP is typically more prominent in *N. forsythi*. *Naonella* type 305 has more prominent VMP, median and 1st laterals perched at higher plane than other laterals, mentum more likely to be curved.

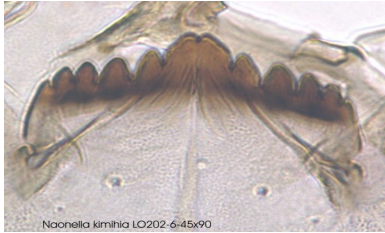
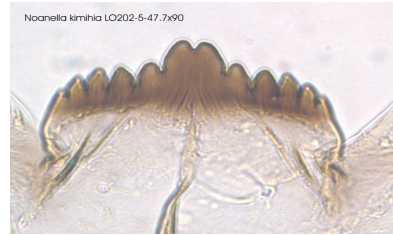
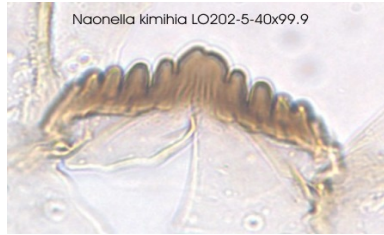
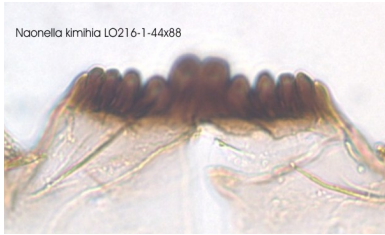
Ecology:

Subfossil: Fairly ubiquitous but more abundant in warmer sites (>10 °C SmT) (Dieffenbacher-Krall et al. 2007). Woodward and Shulmeister (2006) noted that the species is somewhat restricted to low altitudes but remains a component of the fauna up to 1300 m a.s.l. They noted its abundance in ultra-microtrophic to mesotrophic lakes with its optimum at the microtrophic to oligotrophic transition.

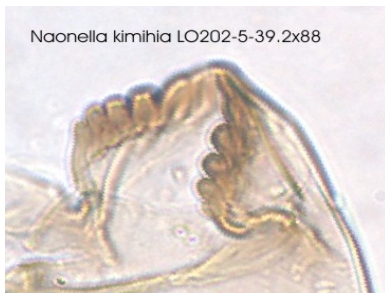
Organism: Boothroyd (2004) stated that little is known about the ecology, but the larvae appear to be epiphytic on stems and leaves of native and introduced submerged aquatic vegetation that occurs in the shallow littoral zones of deep and shallow lakes.

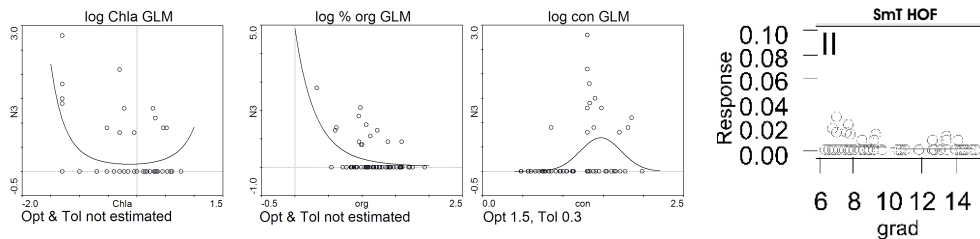
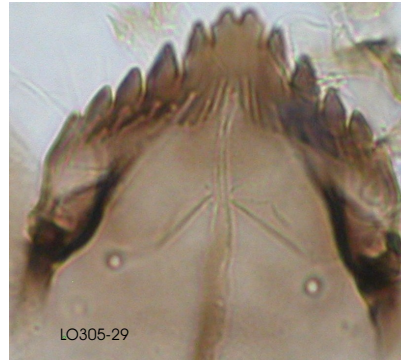
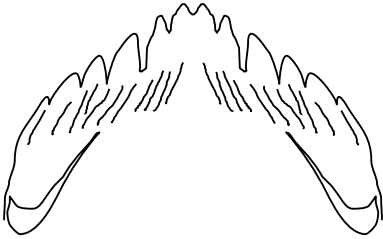
Taxonomic references: Boothroyd 2004

Lakes containing taxon: 53 Dieffenbacher-Krall et al. (2007) sites and 10 of 15 recounted Woodward and Shulmeister (2006) sites.



degraded





Diagnostic characters:

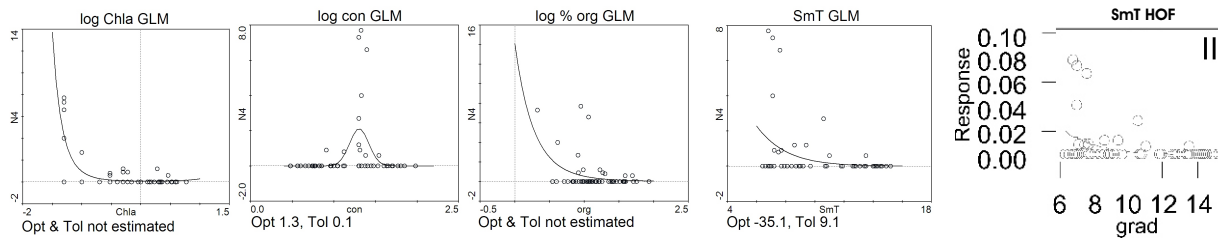
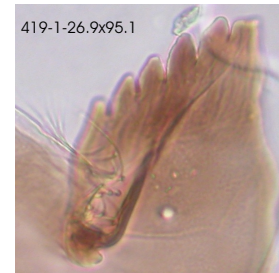
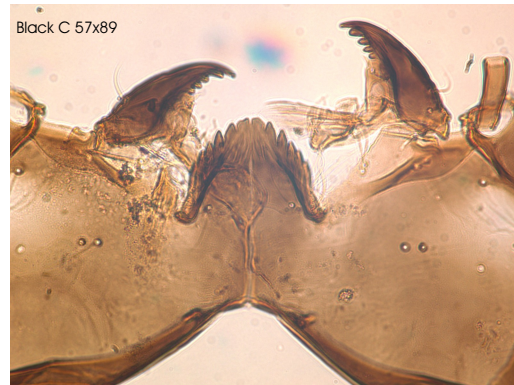
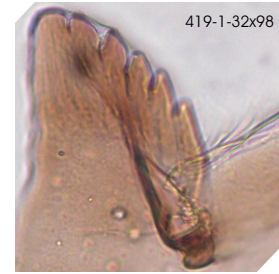
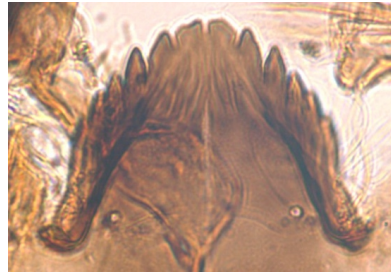
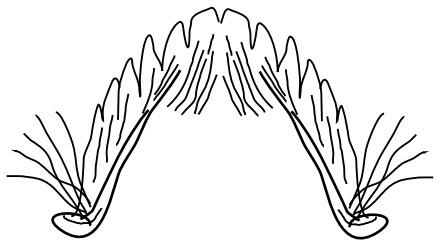
Median bifid, 5 laterals, median and 1st laterals are perched above the plane of the other laterals. Head is light in color, VMP usually readily visible.

Similar taxa: *N. kimihia* is similar but median and 1st laterals are not perched, VMPs are not as prominent, and *N. type 305* does not have a prominent dark line along the bottom of the teeth. *N. forsythi* median and 1st lateral not as perched.

Ecology:

Subfossil: Tends to be found in small numbers. Greatest abundance in site 305, altitude 1840 m a.s.l., for which the taxon was named. Not as strongly linked to temperature as *N. type 419*, but found in greater abundance in cooler sites, with lower productivity and mid-range conductivity. Nearly always found with *N. forsythi*, of which it may be a variation.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 217, 218, 301-303, 305, 306, 308, 317, 407, 410, 418, 419, 421, 422. Recounted Woodward and Shulmesiter (2006) sites Howden, Harris, Sylvan, Alta.



Diagnostic characters:

Median bifid, 5 laterals. Teeth lie along a curved plane. VMP prominent, large loops, much hair. Head is dark in color with prominent eyespots.

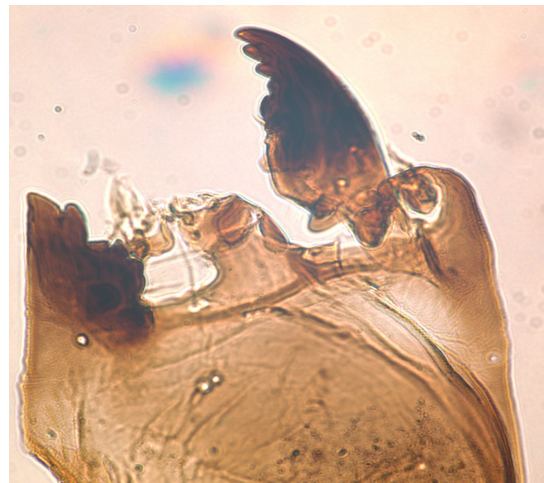
Similar taxa: *Naonella forsythi* is extremely similar, somewhat lighter in color, less prominent VMPs, hair present but usually not visible. Note: *N. type 409* is nearly always found in sites also containing *N. forsythi* and may be a *N. forsythi* variation.

Ecology:

Subfossil: Found in greatest abundance in cool, low productivity sites. Highest abundance was in site 419, altitude 1660 m a.s.l., for which the taxon was named.

Taxonomic references: Includes Orthoclaadiinae 10 of Dieffenbacher-Krall et al. (2007).

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 209, 306-308, 407, 413, 418, 419, 421, 422, 426, 427, 432. Recounted Woodward and Shulmeister (2006) sites Gertrude Saddle/Black, Howden, Harris.

**Diagnostic characters:**

Single broad median, 4 laterals. Mentum curves inward at outer edge. VMPs are plate-like lobes, strongly bearded. Mentum is dark and heavily sclerotized. Mandible has a large 3rd inner tooth.

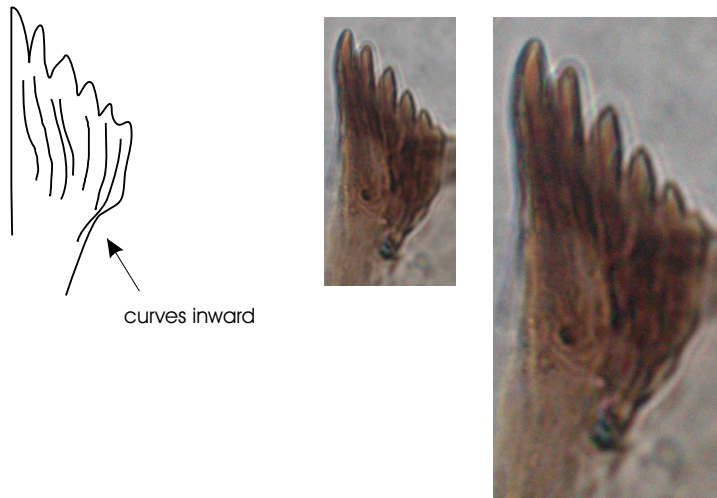
Similar taxa: We suspect *Kaniwhaniwhanus* and Nr. *Kaniwhaniwhanus* may not be distinct at the subfossil level. In the absence of mandibles, and possibly even in their presence, the two types may be indistinguishable.

Ecology:

Subfossil: No data.

Taxonomic references: Known from the Waikato region (Boothroyd, unpub.).

Lakes containing taxon: Recounted Woodward and Shulmeister (2006) sites Harris and Iron.

**Diagnostic characters:**

Single median, often curled at broken edge. 5 laterals. Outer edge of mentum curves inward at bottom. All examples to date have been broken in half.

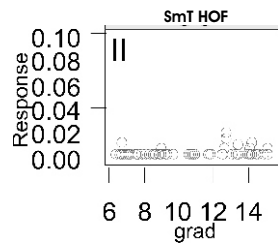
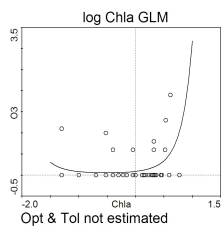
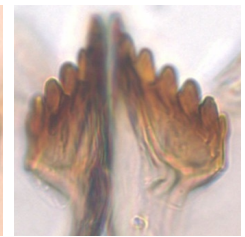
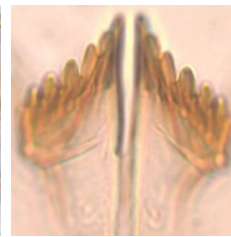
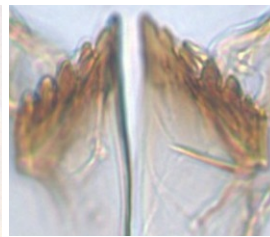
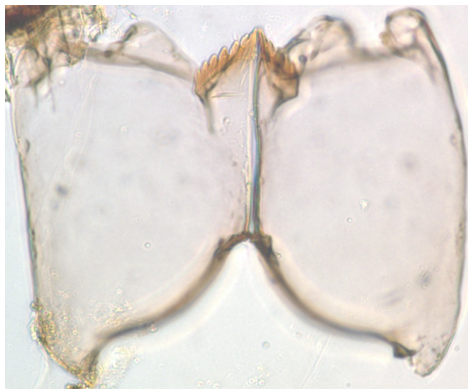
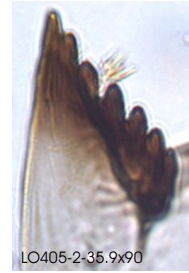
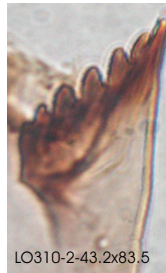
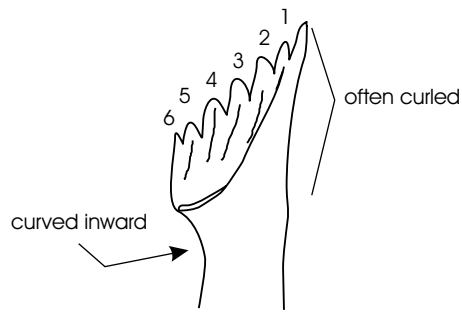
Similar taxa: These are very close in appearance to Orthoclaadiinae 3, which we suspect may simply be curled up *Cricotopus* specimens. However, Ortho 1b has only 5 laterals.

Ecology:

Subfossil: Insufficient data.

Taxonomic references: Also found in South American sites by Massaferrò (unpub.).

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 208, 209, 307, 309, 310, 405, 411, 412, 419, 421, 422, 424, 502.



Diagnostic characters:

Single median, often curled at broken edge. 6 laterals. Edge of mentum curves inward at bottom. All examples to date have been split down the middle.

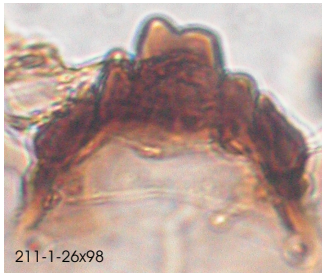
Similar taxa: These are very close in appearance to Orthoclaadiinae 1b, which has only 5 laterals. We strongly suspect Ortho 3 are actually curling *Cricotopus* specimens.

Ecology:

Subfossil: Insufficient data.

Taxonomic references: Also found in South American sites by Massferro (unpub.).

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 208, 218, 301, 302, 303, 304, 310, 311, 324, 419, 501, 507.



Woodward (2006) Ortho A

**Diagnostic characters:**

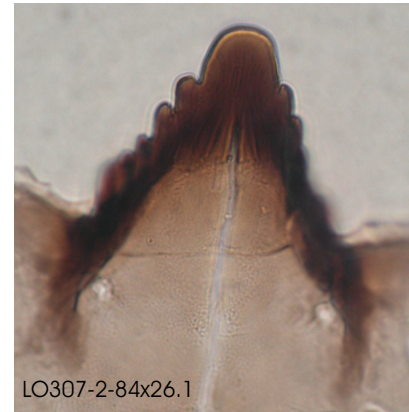
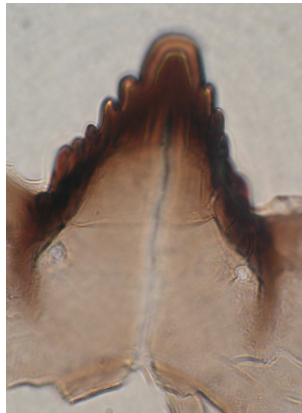
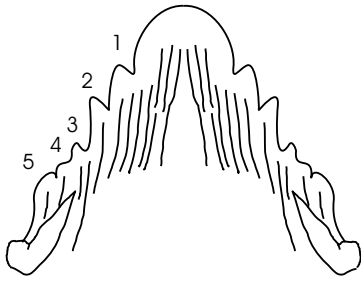
Double median, 5 (4) dark laterals. (Description based on only 3 specimens.)

Ecology:

Subfossil: Insufficient data.

Taxonomic references: Similar to “wood miner” of Cranston (2000), possibly Ortho A of Boothroyd (unpub.). Similar specimens found by Woodward (2006) from New Zealand, and Massaferrò (unpub.) from South America, have lateral teeth more widely spaced and less sloping.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 211, 501, 406 reference.

**Diagnostic characters:**

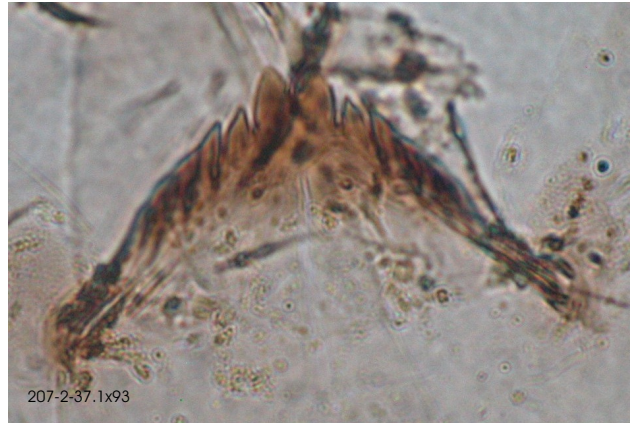
Single specimen found. Tall, steeply sloped mentum. Median rounded, much broader and taller than laterals. 5 laterals, descending in size with 3, 4, and 5 considerably smaller than 1 and 2.

Similar taxa: Most closely resembles Orthoclaadiinae B "Tongue" of Boothroyd (unpub.) and Woodward and Shulmeister (2006) in size of median and slope of mentum, but Ortho B has only 4 laterals.

Ecology:

Subfossil: Insufficient data.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) site 407. Recounted Woodward and Shulmeister (2006) sites Harris, Sedgemere.

**Diagnostic characters:**

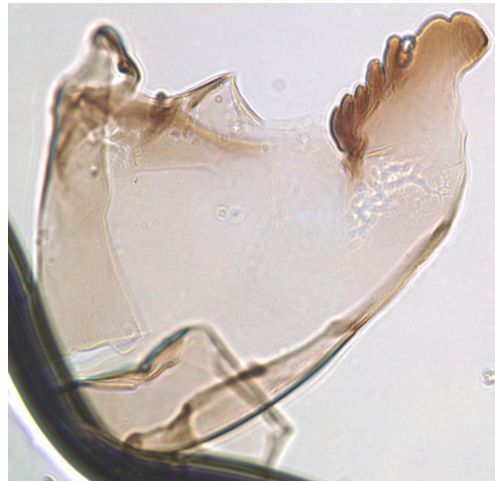
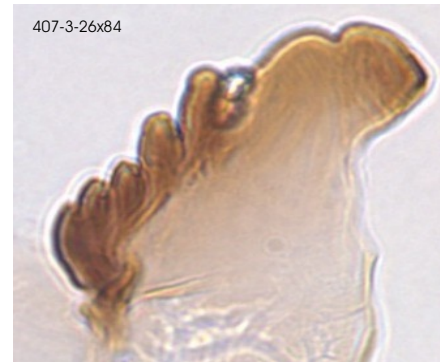
Double median, 5 laterals, median and 1st lateral elevated above other laterals, head and mentum pale in color.

Ecology:

Subfossil: Insufficient data.

Taxonomic references: Possibly Ortho G of Boothroyd (unpub.).

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 207 and 210 reference, 407, 411.

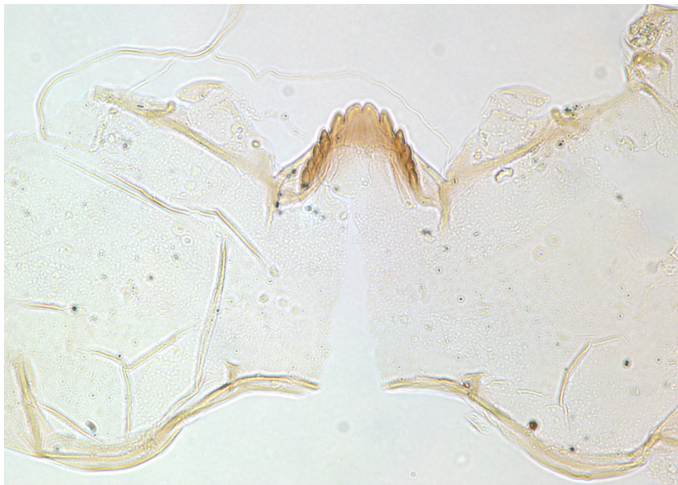
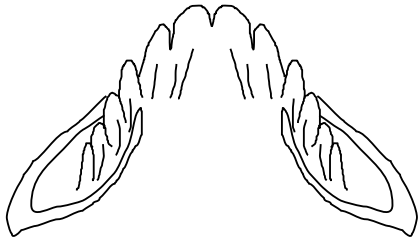
**Diagnostic characters:**

Median double, broad, and rounded. 5 laterals. Laterals 3-5 are small.

Ecology:

Subfossil: Insufficient data.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 324, 407, 413.

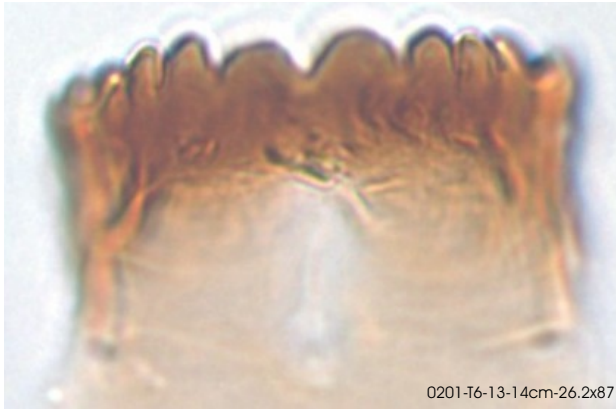
**Diagnostic characters:**

Double median, 5 laterals, steeply sloped mentum, possibly a large VMP.

Ecology:

Subfossil: Insufficient data.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 317 reference, 322, 421. Recounted Woodward and Shulmeister (2006) Sylvester, Alta.

**Diagnostic characters:**

Double median is short, wide, and rounded, no taller than laterals. 5 laterals. (Based on single specimen).

Similar taxa: *SO4* (*sensu* Cranston 2000) is similar in appearance but has only 3 laterals.

Ecology:

Subfossil: Insufficient data.

Lakes containing taxon: Boundary Stream Tarn, fossil (Vandergoes and Dieffenbacher-Krall, unpub.)

**Diagnostic characters:**

Single median broadly rounded, 5 laterals. (Based on a single half specimen).

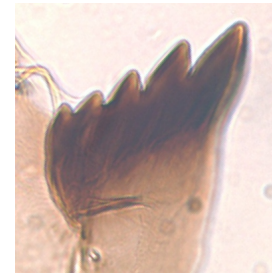
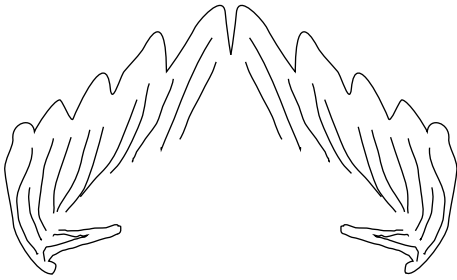
Similar taxa: This is very possibly an Orthocладиinae 8 for which the indentation (bifid division) between halves of the median is not readily apparent.

Ecology:

Subfossil: Insufficient data.

Taxonomic references: May be Ortho J of Boothroyd (unpub.)

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) site 413.

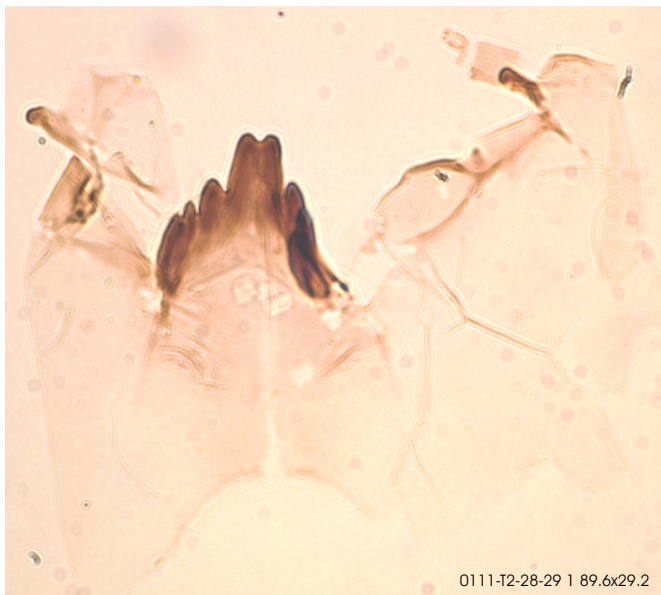
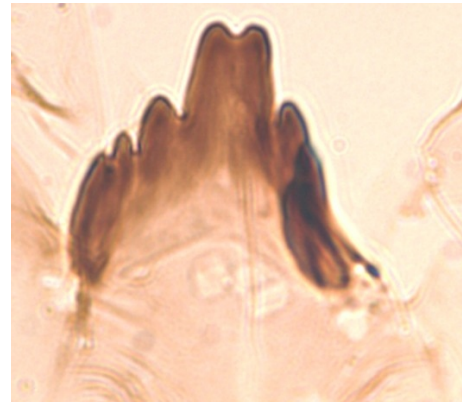
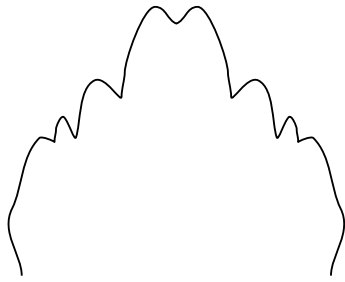
**Diagnostic characters:**

Double median, 4 laterals, 1st lateral much taller than 2-4, laterals 2-4 close in height, teeth evenly dark.

Ecology:

Subfossil: Insufficient data.

Lakes containing taxon: Boundary Stream Tarn, fossil (Vandergoes and Dieffenbacher-Krall unpub.).

**Diagnostic characters:**

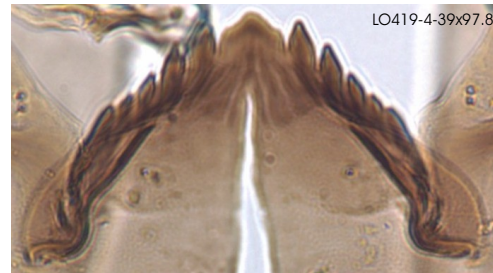
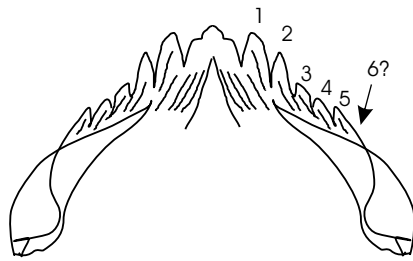
Double median very tall, 3 laterals. Entire mentum is tall. (Based on single specimen.)

Ecology:

Subfossil: Insufficient data.

Taxonomic references: Similar to Orthoclaadiinae 4 but only 3 laterals.

Lakes containing taxon: Galway Tarn, fossil (Vandergoes and Dieffenbacher-Krall unpub.). Recounted Woodward and Shulmeister (2006) site Harris.



Diagnostic characters:

We have found so few specimens of this type that some characteristics are not as yet well defined. Single, broad median is sub-trifid (rounded with shoulders), lighter in color than laterals. 5 (6?) laterals. 1st laterals as tall as median. 2nd lateral shorter than 1st. Laterals 3-5 decrease in size and are considerably shorter than laterals 1 and 2. The ventromental plate is particularly diagnostic in this type being extraordinarily well developed for an Orthoclaadiinae. Outer portion of VMP is broad and rounded, protruding beyond the mentum teeth.

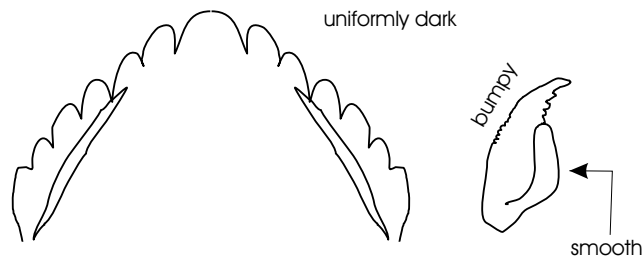
Similar taxa: Woodward and Shulmeister (2006) reported an Orthoclaadiinae species 1/6, which we have reclassified as Diamesinae early instar, having a mentum nearly indistinguishable from *Parakiefferiella*. Diamesinae early instar has an extremely thick post occipital margin. Northern Hemisphere *Parakiefferiella* have 6 laterals (Brooks et al. 2007). We only see 5 on ours, though there may be a tiny, indistinct 6th appressed to edge of the 5th. Ours are not consistent with any of the *Parakiefferiella* types described by Brooks et al. (2007).

Ecology:

Subfossil: Insufficient data.

Taxonomic references: Not noted in any other NZ references of which we are aware.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) site 419.



After Boothroyd 2002.

Diagnostic characters:

Median is single and rounded, 6 laterals. Teeth are uniformly dark. Note bumpy outer edge and smooth inner edge of mandible.

Similar taxa: We did not find any head capsules in our lake sediment that we could identify as *Paratrichocladius*. Subfossil may be difficult to distinguish from *Cricotopus* species. *C. aucklandensis* has a broad median, rounded or with subtrifid (with shoulders), 1st lateral being about $\frac{1}{2}$ the width of the median. *C. planus* has a rounded median more than 1.5 wider and less than 1.5 taller than 1st lateral, 1st lateral width is greater than or equal to $\frac{1}{2}$ the median width, mandible has a notch on outer edge. *C. zealandicus* median is rounded and taller than 1st lateral, 1st lateral width is greater than or equal width of median, no notch on outer edge of mandible. *C. hollyfordensis* median is rounded, median less than 1.5 wider and greater than 1.5 taller than 1st lateral, 1st lateral width is greater than or equal to width of median, notch on mandible outer edge. *C. vincenti* median is slightly flattened, 1st and 2nd laterals partially fused with median, mandible is heavily sclerotized.

Ecology:

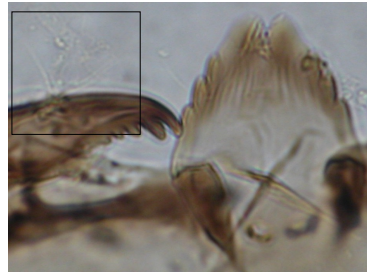
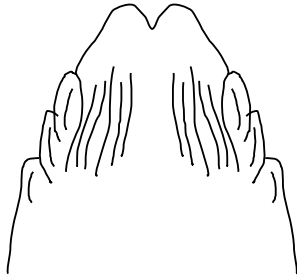
Subfossil: No data.

Organism: Boothroyd 2002: Multivoltine with numbers increasing rapidly in spring, but larvae, pupae, and adults can often be found throughout the year. Larvae often associated with macrophytes such as *Potamogeton* spp., *Nymphaea* spp., and *Salvinia* spp. in shallow fast or slow flowing water, including lakes. Can be locally abundant.

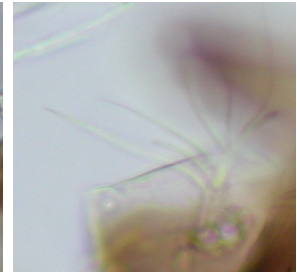
Taxonomic references: Boothroyd 2002.

Lakes containing taxon: None

Pirara/Orthoclaadiinae E (*sensu* Boothroyd unpub.) Orthoclaadiinae



Appears to have palmate setae on mandible.



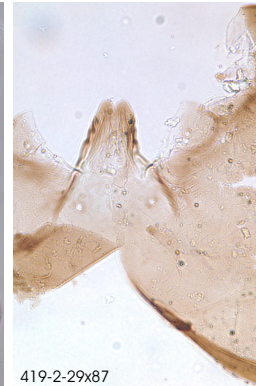
palmate setae



419-5-27x85



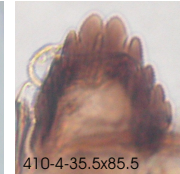
419-1-34x92.4



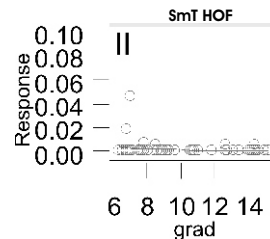
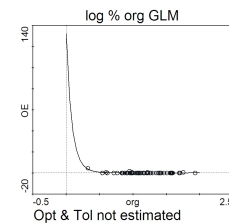
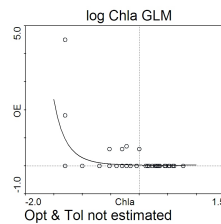
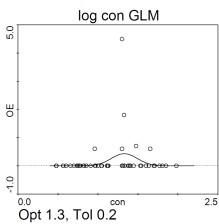
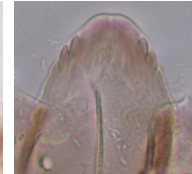
419-2-29x87



LO317



410-4-35.5x65.5



Diagnostic characters:

Double median, 3 or 4 lateral teeth, steeply sloped mentum. *Pirara* has plumose setae but these are not always visible. Orthoclaadiinae E of Boothroyd (unpub.) has more deeply divided median, but we frequently found worn medians. With worn medians and in the absence of plumose setae, *Pirara* is indistinguishable from Ortho E. Head generally dark in color with prominent eyespots.

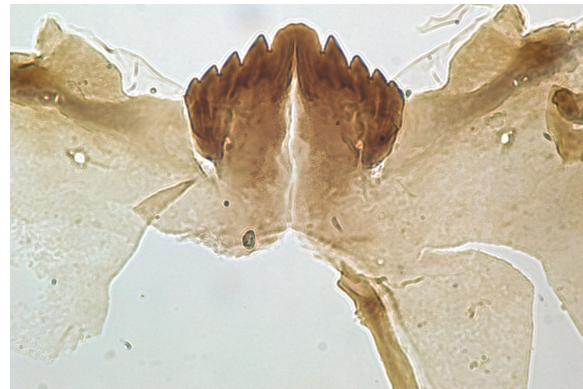
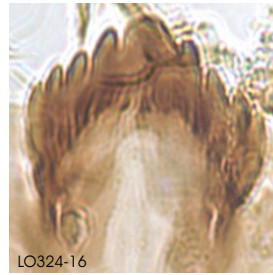
Ecology:

Subfossil: Found chiefly in low-productivity lakes.

Organism: One endemic species, *P. matakiri*, known from New Zealand (Boothroyd and Forsyth 2007).

Taxonomic references: Boothroyd (unpub.), Boothroyd and Cranston 1995.

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 306, 317, 419, 421, 423, 501, 410 reference. Recounted Woodward and Shulmeister (2006) sites Harris, Princess Bath.

**Diagnostic characters:**

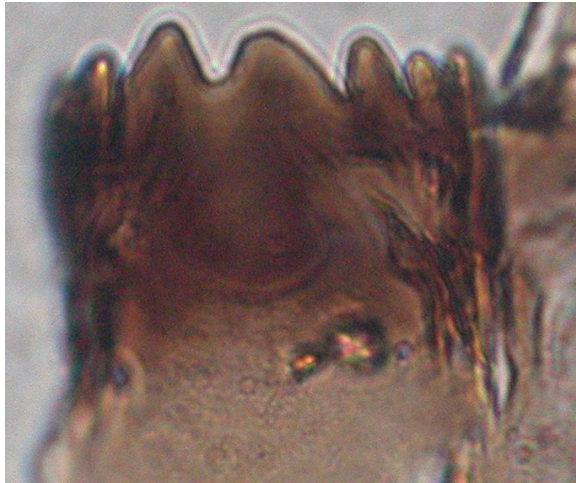
Single, broad median, peaked or rounded. 5 laterals. 1st lateral as tall or nearly as tall as median. Lateral 5 often tiny or absent.

Ecology:

Subfossil: Insufficient data.

Organism: One species of *Smittia*, *S. verna*, known from New Zealand (Boothroyd and Forsyth 2007).

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) sites 307, 324 reference specimens. Recounted Woodward and Shulmeister (2006) sites Gertrude Saddle/Black, Harris.



Diagnostic characters:

Double median is short, wide, and rounded, no taller than laterals. 3 laterals. (Based on a single specimen).

Similar taxa: Orthoclaadiinae 12 looks similar but has 5 lateral teeth.

Ecology:

Subfossil: Insufficient data.

Taxonomic references: Appears to be the SO4 of Cranston (2000).

Lakes containing taxon: Dieffenbacher-Krall et al. (2007) site 211. Recounted Woodward and Shulmeister (2006) site Gertrude Saddle/Black.