

The Status of
Sharpleaf Aster
(*Oclemena acuminata*)

in Newfoundland and Labrador



Photo: Nathalie Djan-Chékar

**THE SPECIES STATUS ADVISORY COMMITTEE
REPORT NO. 13**

February 20, 2008

ASSESSMENT

Assessment: Threatened	Current designation: None
Criteria met: D2. Area of occupancy < 20 km ² and number of locations <5	
Reasons for designation: Qualifies as " <i>threatened</i> " under the SSAC/COSEWIC criteria D2 <ul style="list-style-type: none">• Restricted distribution, area of occupancy << 0.01 km²• Only 1 recently confirmed location and 1 historical location• Recently confirmed population estimated at approximately 1,100 ramets (aerial shoots); total number of mature individuals unknown• Large portion of the known population within highly disturbed public areas of a provincial park• Rescue effect limited	

The original version of this report was prepared by John E. Maunder on behalf of the Species Status Advisory Committee.

STATUS REPORT

Oclemena acuminata (Michaux) Greene
Sharpleaf Aster, Whorled Wood Aster; Fr: aster acuminé.

Synonyms:

Aster acuminatus Michaux

Family: Asteraceae (Composites)

Life Form: Herbaceous, perennial, clonal forb.

Distribution

Global:

North America: Canada [see more detail below]. United States of America: several eastern states, *including* Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, New Jersey, Maryland, Virginia, West Virginia, North Carolina, Georgia, Ohio, Kentucky, Tennessee (Brouillet 2006).

National:

Newfoundland and Labrador (Newfoundland only), Nova Scotia, Prince Edward Island, New Brunswick, Québec, and Ontario (Brouillet 2006).

Provincial:

On the Island of Newfoundland, known only from two very small localities on the west coast (Fig. 1).

Annotated Range Map

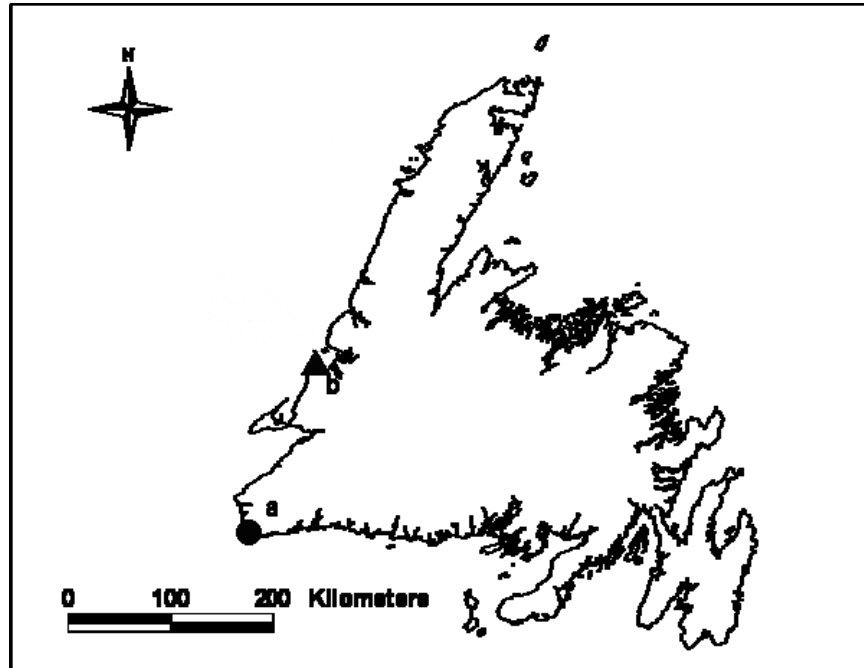


Figure 1. Known localities for *Oclemea acuminata* in Newfoundland: [a] J. T. Cheeseman Provincial Park and area (including Fernald's historical "Port aux Basques (back of)" locality), [b] Lark Mountain (historical).

Description

An inconspicuous white-flowered aster, with broadly whorled upper leaves. Grows in extensive, lax clones in shaded woodland situations.

Habitat

Cool, dry to moist forests with usually well-drained, often acidic soils. Red spruce-Fraser fir Appalachian forests (in the south); to hemlock-white pine-northern hardwood Acadian forests, aspen-white birch groves, or southern-exposed open fir forests (in the north); sometimes, also, clearings and forest edges, ridges. 0–2000 m (Brouillet 2006).

In Newfoundland, generally occurs in coniferous forest.

J. T. Cheeseman Provincial Park and area:

Within the Park campground area: white spruce (*Picea glauca*)/balsam fir (*Abies balsamea*) woods on first or second level terraces very near Barachois River, with an 80% understory coverage of grasses, forbs (*Cornus canadensis*, *Dryopteris campyloptera*, *Solidago rugosa*, *Linnaea borealis*, *Maianthemum canadensis*) and shrubs (*Sorbus americana*), and interrupted moss cover (*Dicranum* sp., *Polytrichum* sp., and *Plagiomnium* sp.); forest floor of needle litter overlying sandy silt; filtered light.

Along the Park “fitness trail”: an upland, fairly shaded, stunted balsam fir grove, with an open understory of *Cornus canadensis* and *Aralia nudicaulis*.

Back of Port aux Basques (historical): Spruce thickets among the gneiss hills.

North of Park: edge of balsam fir forest on shore of brook; moist soil; partly shaded

Lark Mountain (historical):

Spruce woods.

Overview of Biology

Oclemena acuminata is a clonal “Appalachian species” (Brouillet and Simon 1981), adapted to dry to moist forest environments with relatively low light levels. Its mid-leaves are usually largest, and arranged in pseudo-whorls to minimize self-shading and maximize light capture. When growing in exposed habitats, at forest edges, in clearings, or on ridges, its ramets (ie. “individual plants” within a clone) often have reduced chlorophyll and reduced size. The species has been the object of several ecological studies (Ashmun *et al.* 1982, 1985; Brouillet and Simon 1979, 1981; Hughes *et al.* 1988; Pitelka and Curtis 1986; Pitelka *et al.* 1980, 1985; Winn and Pitelka 1981).

Ramets grow in size during the late spring and early summer, produce rhizomes during the summer, and flower (or not) during late summer and early fall. Flower primordia are produced just prior to flowering, rather than in the previous year, allowing the plant to make real-time “decisions” regarding whether or not to flower in any particular year (Pitelka *et al.* 1980, 1985).

At J. T. Cheeseman Provincial Park, plants with developing flowers were observed on July 12 2007 (Maunder et al.) and July 31, 2006 (Maunder), plants with mature flowers were observed in September 6, 2000 (Djan-Chékar et al.) and October 15, 2006 (Maunder); plants with mature seeds were observed on October 15, 2006 (Maunder).

While generally considered to be a perennial, *O. acuminata* has an annual or pseudo-annual “biomass allocation strategy”, in that, [1] aerial stems rarely if ever grow from the same rhizome node in successive years, [2] each year’s new aerial stems arise from newly grown sections of rhizome, [3] connections between rhizome branches decay within *one* (to three) years, so that [4] most ramets within a greater clone are physiologically independent (Pitelka *et al.* 1980). Indeed, Ashmun *et al.* (1982) demonstrated that, in *O. acuminata*, virtually no inter-module transfer of ¹⁴C photoassimilate occurs.

In general, forest herbs occur in fairly discrete genets (ie. clonal units) that can be some distance from other genets of the same species. The overall density of genets is usually low, but ramet density within individual genets can be quite high. Forest herbs are often characterized by low rates of sexual reproduction, very high rates of vegetative reproduction, and extremely low rates of establishment by seed. However, on a local scale, the rate of sexual reproduction often varies greatly from genet to genet, and from year to year (Pitelka *et al.* 1980).

In most respects, *O. acuminata* is a classic example of a forest herb. However, it has also been described as a “microsuccessional species”, since it is most often found in somewhat open and slightly disturbed patches within the forest (Pitelka *et al.* 1980).

O. acuminata is able to adapt to a very wide range of light levels by dramatically adjusting its resource allocations (Pitelka and Curtis 1988). In open, disturbed sites, higher light levels produce larger and more vigorous ramets. Larger ramets are more likely to flower. In more mature, more closed-canopy, forest sites, with lower light levels, ramets tend to be much smaller, and much less vigorous. Smaller ramets are less likely to flower. On the other hand, vegetative reproduction, via the proliferation of rhizomes, seems constant, regardless of light levels (Pitelka *et al.* 1985), and individual genets may survive at least for several decades (Pitelka *et al.* 1980).

For *O. acuminata*, Hughes *et al.* (1988) demonstrated that during the first few years after a disturbance event that opens the canopy (ie. treefall, artificial forest clearing), flowering and seed production increases dramatically. During this period, seeds disperse, existing genets expand, and new genets establish. However, by about 10 years after a disturbance event, seed production will have generally declined to very low levels, and genet expansion will have virtually

ceased. As available light decreases, the density of ramets within a genet also decreases. Seeds are not viable after 1 or 2 years (Winn and Pitelka 1981).

However, while light is the most critical environmental resource for *O. acuminata*, it does not primarily determine where genets will occur. Hughes *et al.* (1988) concluded that, for this species, the location of *suitable seedbeds* (ie. areas where the litter has been disturbed or cleared away), in conjunction with the availability of seeds during the first few years after a disturbance event, is what actually determines where genets CAN establish. It is only after light resources become limited, due to canopy development, that resource availability (principally light) determines which genets *will* or *will not* persist.

Population Size and Area of Occupancy

There are two main areas within J. T. Cheeseman Provincial Park where *O. acuminata* is known to occur, one in the campground, the other along the “fitness trail “. Within the campground, the “population size” of *Oclemena acuminata* is about 1000-1100 ramets. Along the “fitness trail”, there are about 50 additional ramets. A few more ramets were located just north of the Park, along a small tributary of the Barachois River, by C. Hanel, in 2003. Thus the total “population” of *O. acuminata*, in the greater Cheeseman Park area, is probably about 1150-1250 ramets (though possibly as few as five genets). Nevertheless, many ramets are small and non-flowering. A rough estimate of 300 flowering ramets, for the Cheeseman Park area, in any given year, is probably reasonable.

Neither the population size nor the area of occupancy of the historical populations at either “Port aux Basques (back of)”, or Lark Mountain, is known. [Fernald’s “Port aux Basques (back of)” population is herein considered to have occurred somewhere within the general area of J. T. Cheeseman Provincial Park, although this is not known for sure.]

It should be appreciated that “the number of mature individuals capable of reproduction”, as a direct measure of potential survivability, is not a particularly useful indicator for species such as *O. acuminata*, where, except during years immediately following a disturbance event, reproduction is primarily vegetative, by proliferation and fragmentation of rhizomes.

Traditional and Local Ecological Knowledge

No published or other evidence has been found regarding the aboriginal use of this species within the Province. In particular, a specific inquiry to the Federation of Newfoundland Indians in 2007 yielded no definitive information. Arnason *et al.*

(1981) did not include the species in their study of the ethnobotany of eastern Canada.

Trends

The overall population of *O. acuminata* has probably been stable over time. However individual patches are subject to changing habitat conditions. The various individual patches in the Park seem, at present, to be operating at somewhat different successional stages. Some patches are flowering reasonably freely and producing copious seed, and are thus probably contributing to ongoing patch expansion and new colonization; while other patches seem to be flowering much more poorly, and are quite possibly in active decline.

Threats and Limiting Factors

Within the J. T. Cheeseman Provincial Park campground, any campsite construction, including even such seemingly minor events as the relocation of pit toilets, would be quite disastrous if carried out within the very few small patches of *Oclemena acuminata*.

The relatively open nature of the present *O. acuminata* habitat within the park campground is primarily the result of artificial thinning of the understory, associated with campground and trail development and grooming. So, it might be supposed that, if the existing patches of *O. acuminata*, within the Park, are to be maintained unaltered, such artificial thinning may have to be both continued, and carefully managed.

Rank or Status

Global	
G-rank	G5
IUCN	not assessed
National	
N-rank	NNR (not ranked)
National General Status	4
COSEWIC	not assessed
Provincial	
Provincial General Status	2
Newfoundland S-Rank	S1
Newfoundland General Status	2
Labrador S-Rank	not present
Labrador General Status	not present
Adjacent Jurisdictions	
Nova Scotia S-Rank	S5
Nova Scotia General Status	4
Prince Edward Island S-Rank	S5
Prince Edward Island General Status	4
New Brunswick S-Rank	S5
New Brunswick General Status	4
Québec S-Rank	S5
Québec General Status	4

[Note: Where available, ranking data from the biodiversity databases of the individual Provinces has been used. Otherwise, General Status ranks are based upon the “General Status of Species in Canada (2005)”, and S-Ranks are based upon “NatureServe Explorer”. Where there is apparent discrepancy, NatureServe Explorer ranks are considered to be the least current.]

Existing protection.

The J. T. Cheeseman Provincial Park populations are protected, but because of their exposed aspect, scattered within active campground and trail areas, they are still very vulnerable.

Special Significance

None.

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Collections Examined

Provincial Museum of Newfoundland and Labrador (NFM).
Two herbarium collections.

TECHNICAL SUMMARY

Distribution and Population Information	Criteria Assessment
<i>Extent of occurrence (EO)(km²)</i>	± 150 km ² ; assuming that the “historical” Lark Mountain population still exists; otherwise = AO
<i>Area of occupancy (AO) (km²)</i>	± 0.00006 km ² [Cheeseman Park only], the AO of “historical” Lark Mountain population, if the population still exists, is unknown
<i>Number of extant locations</i>	2 (including 1 “historical” location)
<i>Specify trend in # locations, EO, AO (decline, stable, increasing, unknown)</i>	probably stable
<i>Habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat</i>	probably stable
<i>Generation time (average age of parents in the population) (indicate years, months, days, etc.)</i>	perennial; but functionally an annual or pseudo-annual; connections between rhizome branches disintegrate after 1(-3) years
<i>Number of mature individuals (capable of reproduction) in the Provincial population (or, specify a range of plausible values)</i>	approximately 1050-1150 ramets [at Cheeseman Park only]; but, only ± 25% of these flowering in any given year; nonetheless, significant vegetative reproduction occurs; size of “historical” Lark Mountain population unknown
<i>Total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals or number of populations</i>	probably stable over time
<i>Are there extreme fluctuations (>1 order of magnitude) in number of mature individuals, number of locations, AO and/or EO?</i>	percentage of individuals flowering can fluctuate from year to year in response to environmental conditions
<i>Is the total population severely fragmented (most individuals found within small and isolated populations)</i>	The historical Lark Mountain population is disjunct
Rescue Effect (immigration from an outside source)	
<i>Does species exist elsewhere?</i>	Yes
<i>Status of the outside population(s)? [adjacent Provinces only]</i>	Nova Scotia, Prince Edward Island, New Brunswick, Québec, secure
<i>Is immigration known or possible?</i>	presumably possible
<i>Would immigrants be adapted to survive here?</i>	Unknown
<i>Is there sufficient habitat for immigrants here?</i>	Unknown

Appendix A. Population Information

Recently verified occurrences/range use (recorded within the last 25 years)

Verified occurrences consist of observations supported by the collection of a voucher specimen (i.e. a sample to be identified/confirmed by experts and deposited in a herbarium) (Fig. A-1).

August 3, 2000. J. T. Cheeseman Provincial Park. E-side of Barachois River; S of bridge. Small wooded area in campground along a stream; overstory *Abies balsamea*, understory cover 80%, of grasses, and forbs, interrupted moss cover of *Dicranium* sp. and *Plagiomnium* sp.; substrate forest floor overlying sandy silt. [Observers: C. Hanel, and S. Powell. Collection: CH 000803-5 = NFM-5594 (Provincial Museum of Newfoundland and Labrador). Determined by Stuart Hay.]

September 6, 2000. J. T. Cheeseman Provincial Park. E-side of Barachois River; S of bridge. Small wooded area in campground along a stream; overstory *Abies balsamea*, understory cover 80%, of grasses, and forbs, interrupted moss cover of *Dicranum* sp. and *Plagiomnium* sp.; substrate forest floor overlying sandy silt. [Observers: N. Djan-Chékar, C. Hanel, L. Lafosse, and H. Mann. Collection: NDC 00-1484 = NFM-5569 (Provincial Museum of Newfoundland and Labrador). Determined by Stuart Hay.]

September 6, 2000. J. T. Cheeseman Provincial Park. Patch of *Picea* sp. and *Abies balsamea* with continuous understory of forbs; filtered light. Forming a lush cover. Small wooded area in campground along a stream; overstory *Abies balsamea*, understory cover 80%, of grasses, and forbs, interrupted moss cover of *Dicranum* sp. and *Plagiomnium* sp.; substrate forest floor overlying sandy silt. [Observers: N. Djan-Chékar, C. Hanel, L. Lafosse, and H. Mann. Collection: no specimen collected, but voucher photo taken (Provincial Wildlife Division).]

September 6, 2000. J. T. Cheeseman Provincial Park. [Observers: N. Djan-Chékar, C. Hanel, L. Lafosse, and H. Mann. Collection: no specimen collected, however, direct field comparison was made with collection NDC 00-1484.]

September 23, 2003. Port aux Basques area. Shore of brook at edge of *Abies balsamea* forest; moist soil; partly shaded. Elevation: 320 feet. [Observers: C. Hanel. Collection: CH 020923-3. NFM (Provincial Museum of Newfoundland and Labrador - not yet accessioned).]

July 31, 2006. J. T. Cheeseman Provincial Park. Open. Within balsam fir woods (limbed-out below by park). Understory of *Cornus canadensis*, *Dryopteris campyloptera*, *Solidago rugosa*, *Linnaea borealis*, *Maianthemum canadensis*, *Sorbus americana* (shrubs), *Polytrichum* sp. (moss). Forest floor of needle litter. Plants all in very early flower; ray flowers not yet opened out to form a flat ray disc. Patch about 8 x 5 m. 250-300 stems. [Observer: J. E. Maunder. Collection: no specimen collected, but, diagnostic photos taken (Maunder (ongoing) and present report).]

October 15, 2006. J. T. Cheeseman Provincial Park. Open. Within balsam fir woods (limbed-out below by park). Understory of *Cornus canadensis*, *Dryopteris campyloptera*, *Solidago rugosa*, *Linnaea borealis*, *Maianthemum canadensis*, *Sorbus americana* (shrubs), *Polytrichum* sp. (moss). Forest floor of needle litter. Plants all in seed; lower foliage fading and falling. Patch about 8 x 5 m. 250-300 stems. [Observer: J. E. Maunder. Collection: no specimen collected, but, diagnostic photos taken (Maunder (ongoing) and present report).]

October 15, 2006. J. T. Cheeseman Provincial Park. Depression in clearing between large balsam fir. 10 x 3 m. About 500-600 stems. [Observer: J. E. Maunder. Collection: no specimen collected, but, diagnostic photos taken (Maunder (ongoing) and present report).]

October 15, 2006. J. T. Cheeseman Provincial Park. A few, scattered plants. [Observer: J. E. Maunder. Collection: no specimen collected, but, diagnostic photos taken (Maunder (ongoing)).]

October 15, 2006. J. T. Cheeseman Provincial Park. Small population; about 150 stems. [Observer: J. E. Maunder. Collection: no specimen collected, or diagnostic photos taken; however, plants were directly compared with other plants from the same campground population, on the same day.]

July 12, 2007. J. T. Cheeseman Provincial Park, along the Park "fitness trail" towards Smokey Cape. Area about 1 m x 2 m. Population estimate, about 50 ramets. Balsam fir grove. Fairly shaded. Understory of *Cornus canadensis* and *Aralia nudicaulis*. Mesic. [Observers: Claudia Hanel, J. E. Maunder. Collection: no specimen collected, but, diagnostic photos taken (Maunder (ongoing) and present report).]

Recent Search Effort (areas searched within the last 25 years with estimate of effort)

General rare plant surveys of the west and northeast coasts of the Island were conducted by members of the Newfoundland Rare Plant Project (*q.v.*), specifically during 1999 to 2001, when 1645 individual sites were surveyed and 7622 plant collections were made. Additional general rare plant surveys have been conducted within the Province by various National Parks personnel, and by J. E. Maunder of the Provincial Museum and H. Mann of Sir Wilfred Grenfell College (early 1970's to present), as well as by N. Djan-Chékar of the Provincial Museum (2002 to present). Significant additional general collecting has been conducted, on the south coast of the Island, by R. Etcheberry, of St.-Pierre et Miquelon (1986, 1987, 1989, 1990, 1992, and 1993).

Targeted rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of the publication "The Rare Vascular Plants of the Island of Newfoundland" (Bouchard *et al.* 1991), in: 1984 and 1985 (Gros Morne National Park), 1986 (southwest coast, and the general Port au Port area), 1987 (Great Northern Peninsula), 1988 (Baie Verte Peninsula, Notre Dame Bay, and central and eastern Newfoundland), 1989 (Gros Morne National Park, and the south coast), and 1990 (west coast, and Great Northern Peninsula).

Geographically focused rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of contracted rare plant reports for Port au Choix National Historic Park (Bouchard *et al.* 1993), L'Anse aux Meadows National Historic Park (Bouchard *et al.* 1993), Gros Morne National Park (Anions, 1994; Bouchard *et al.*, 1985, 1986, 1991, 1994, 1996; and Brouillet *et al.*, 1998), and Terra Nova National Park (Brouillet *et al.* 1997). Additional geographically focused rare plant surveys were conducted in the Squid Cove and Doctors Brook areas, and the Labrador Straits region by C. Hanel (2004, 2005a, 2005b).

Historical Verified Occurrences/Range Use (recorded prior to the last 25 years) (Fig. A-1)

August 31, 1924. Port aux Basques (back of) [considered to be essentially the same locality as the J. T. Cheeseman Provincial Park locality]. Spruce thickets among the gneiss hills. Latitude: 47° 34' 12" Longitude: 59° 90' 75". [Observers: M. L. Fernald, B. Long, B. Dunbar. Collection: 27139. GH (Gray Herbarium).]

September 1, 1926. Lark Mountain (southern slope of). Spruce woods. Latitude: 49° 07' 12" Longitude: 58° 82' 23". [*wrong ... possibly 58° 22' 23"*] [Observers: M. L. Fernald, B. Long, J. M. Fogg. Collection: 460. GH (Gray Herbarium). K (Kew).]

Other Observations (unverified occurrences)

Rouleau and Lamoureux (1992: map 701) record an occurrence of *Aster* ×*blakei* (*Oclomena acuminata* X *O. nemoralis*) from near Riverhead, St. Mary's Bay. However, since the origin of this record is presently unknown, and since the locality in question is more than 400 km east of the nearest known occurrence for one of the parents (*O. acuminata*), the record seems doubtful (see also: the "Taxonomic Clarifications" section Appendix B).

Potential Sites Unexplored

The forested regions of western Newfoundland have, on balance, been poorly searched. Given the significant distance between the known Cheeseman Park localities, and the historical Lark Mountain locality, as well as the generally inconspicuous nature of the species, it would seem that additional populations must exist in the forests of at least the southwest coast. Often botanical field work in the province is carried out early in the season, prior to flowering time for most asters.

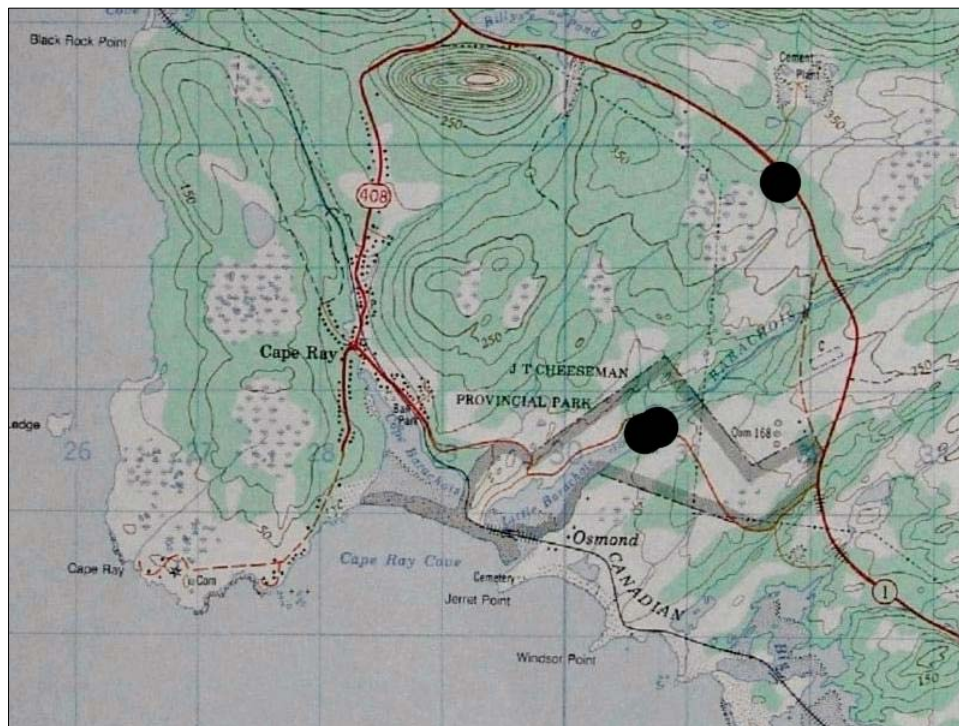


Figure A-1. Specific locations of *Oclemena acuminata* in Newfoundland: [top] J. T. Cheeseman Provincial Park and area; [bottom] Lark Mountain, Bay of Islands (“historical” locality [position of triangle is approximate]).

Appendix B. Supplementary Details

Taxonomic Clarifications

Oclemena xblakei is a widespread, frequently occurring, mostly F₁ [ie. first generation] hybrid between *O. acuminata* and *O. nemoralis*. Its validity has been confirmed by morphological and chemical data (Pike 1970; Hill and Rogers 1973; Brouillet and Simon 1981), as well as by isozyme [ie. molecular] data (Brouillet 1977). Hybrid populations often include backcrosses with both parents, as well as later generation hybrids and variously introgressed [ie. backcrossed] individuals (Brouillet 2006).

O. xblakei has been reported from the Port aux Basques area by Pike (1970), Brouillet and Simon (1981), and [apparently in error] by Brouillet (2006); but, was not reported by Meades *et al.* 2000. Luc Brouillet has lately revised all Newfoundland specimens to either "*E. [Eurybia = Aster] radula* or to one of the parents" [ie. to *O. acuminata* or *O. nemoralis*] (Luc Brouillet, personal communication, May 16, 2007).

Thus, the hybrid *Oclemena xblakei* is not, herein, recognized for Newfoundland.

Description (Fig. B-1)

Perennial herb, growing in extensive, lax clones. **Plants** (2)10-80(100) cm tall. **Stems** 1, erect, stout (2-4 mm diameter), flexuous, simple, ± densely villosulous, eglandular. **Rhizomes** superficial, elongate, herbaceous or woody, simple. **Leaves** 11-18, sometimes ± crowded distally (often seemingly whorled); proximal leaves often withering by flowering time; sessile or winged-subpetiolate; blades obovate to oblanceolate, (20)60-150(170) × (2)10-45(50) mm; bases cuneate to attenuate; margins flat, ciliate, serrate distally, with sharp, acuminate teeth; apices acuminate; faces sparsely villosulous (abaxially mostly along veins and very sparsely stipitate-glandular). **Heads** (1)5-46(61+) in open corymbiform arrays; branches arching-ascending, at nearly right to ± acute angles with stems. **Peduncles** thin, 0.9–4.5 cm, densely villosulous, eglandular. **Bracts** 1-2, linear, sparsely villosulous. **Involucre** 5-10 mm. **Phyllaries** linear-lanceolate to linear, sparsely villosulous or glabrous, sparsely gland-dotted. **Ray florets** (9)15(18); corollas white, seldom pinkish, 15-20 × 1.4-2 mm. **Disc florets** 14-30; corollas enlarged outwardly, 5.5-7.5 mm, sparsely glandular; tubes shorter than the narrowly campanulate, sparsely strigillose throats; lobes reflexed, 0.5-1 mm. **Cypselae** [ie. "seeds"] tan, fusiform-obconic, ± compressed, 2.8-3.6 mm, ribs 3-5 (concolorous with bodies), faces glabrous, gland-dotted. **Pappi** of whitish bristles in 3 series, outer shorter than disc corollas (innermost attenuate). **2n** = 18. (Modified after Brouillet 2006, and Semple *et al.* 2000). "Flora of North America" image at: http://www.efloras.org/object_page.aspx?object_id=57429&flora_id=1



Photos: John E. Maunder

Figure B-1. Description (*Oclemena acuminata*): [a] flowering head just expanding (July 31, 2006), [b] over-mature flowering head badly battered by a recent rainstorm (October 15, 2006), [c] seed head (October 15, 2006), [d] characteristic zig-zag stem, [e] top view, showing “whorled” or “staggered” leaf configuration that allows for maximized capture of light from above (ref. Brouillet and Simon 1979), [f] mass of flowering ramets (last three photos July 31, 2006).

Habitat (Fig. B-2 and B-3)



Photos: John E. Maunder

Figure B-2. Habitat (J. T. Cheeseman Provincial Park): [a] a compact grove of trees, [b] *Oclemena acuminata* habitat in that same grove of trees, viewed from the adjacent campsite, [c] clearing *within* that same grove of trees, [d] *O. acuminata* habitat, under trees, in background.



Photos: John E. Maunder

Figure B-3. Habitat (J. T. Cheeseman Provincial Park): Newly-discovered [2007] woodland site along the Park “fitness trail”.

Collections Examined

Provincial Museum of Newfoundland and Labrador.

NFM 5569, NFM 5594 [see Appendix A for details].