

Visual Keys to Norfolk Goosefoots & Oraches *Chenopodium* & *Atriplex*

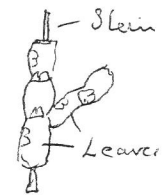
Bob Leaney Nov 2017

Chenopodium & *Atriplex* until recently were in the family *Chenopodiaceae* (Stace II, 1997), but have now been amalgamated along with *Amaranthus* into the family *Amaranthaceae* (Stace III, 2010). The genera within this family are often succulent, with usually very small inconspicuous flowers with 1 whorl of 1-5, usually green, tepals that are free or partly fused, and fruits that are one seeded & usually indehiscent (ie achenes) - *Amaranthus* has (usually) "1 seeded capsules" (capsule usually defined as multi-seeded!).

Other genera within *Amaranthaceae* :-

Amaranthus : Tepals scarious, always (usually v. similar bractesles) 
(Pigweeds)
↓
Tepals herbaceous, bractesles often absent.

Salicornia / *Sarcocornia* ↓
(Glassworts)
Leaves very succulent fused in pairs round stem



Leaves < 5 mm wide, succulent, not flattened



Leaves > 5 mm wide, flattened

↓
Flowers unisexual: → *Spinacia*
→ *Atriplex*

Salicornia & *Sueda*

Flowers bisexual: *Chenopodium* (& *Dysphalia*)
+ *Corispermum*, *Bassia*, *Beta* group (Bussard) (summercypress)

Differences between *Chenopodium* & *Atriplex*:

(1) Vegetative (i) Balloon hairs (meakiness):

Only works 1 foot with very small plants c 5-10cm high on the just opened tiny 1st leaves. (for *Chen. alb.* vs *Atr. pro*)



Chen. album



Atr. pro.

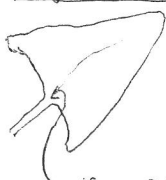
(Doesn't work very well)

Definite *Atr. pro*

Definite *Ch. alb*

Intermediate leaf based shape

Can be useful but often doesn't seem to work!



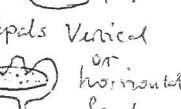
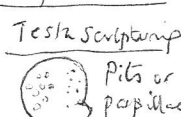
Chen. album
Can have basal layer & widely curved base

180-220° (hastate)

(ii) Colour at maturity :-

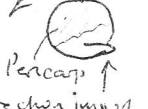
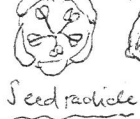
Both *Chenopodium* & *Atriplex* spp turn red often at maturity, but only *Atriplex* turns yellow (good spotting feature for *Atr. longipes* & *X. guskiatoma* in saline habitats)

(2) Floral characters :-
on female flowers.



Chenopodium

Atriplex has bractesles



Atriplex

Visual Key to Noctic Chenopodium species . . . Bob Heaney Nov 2017

This key is based on the 1997 Stee Key, but missing out most of the rare alien species that are now very unlikely to be found in the country. These were once brought in as contaminants in wool, grain or bird seed, but did not persist. One species, C. quinoa, is becoming more frequent, being widely planted for game food. ~ it is quite easily recognised as looking like a robust C. album with a very dense inflorescence with strawcoloured, yellow, red or orange tepals.

1 Stems glandular pubescent plant aromatic ~ 5 extreme rarities (now under genus Dysphania)
 1 Stems not glandular pubescent, plant not aromatic 2

2 Stems woody below, branches end in weak spinous points C. nitariaceum
 2 Stems herbaceous, branches not ending in weak spinous points (extreme rarity) 3

3 Flowers in globose, sessile axillary heads (> 5 mm across) which are red & succulent at fruiting (strawberry like) 1 C. capitatum

3 Flowers in loose racemes or panicles, heads < 5 mm across, not red or succulent in fruit. 4 (strawberry-like)

4 Rhizomatous perennial, stigmas 0.8 - 1.5 mm long, leaves thick succulent triangular, hastate at base, Archeophyle and with prominent 5-lobed lobes. Roadverner paddocks.  Occasionally escapes from gardens

4 Annuals, stigmas < 0.8 mm long 5 C. bonus-henricus (Good King Henry)

5 Fruiting perianth mostly longer than wide, seeds vertical or oblique, inflorescence glabrous. 6  Perianth

5 Fruiting perianth not wider than long, seeds horizontal, in inflorescence often mealy. 8  Perianth

6 Leaves green on upper side, mealy-gray on underside . . .

V. rare; Many waste places

Archaeophyte

C. glaucum



6 Leaves green (or reddish green) on both sides . . .

Oak-leaved goosefoot

7 Tepals of lateral fruits fused to $< \frac{1}{2}$ way,
(in each cluster)

leaves usually with well developed lobes above basal lobes

* Usually arable & esp. meadows, native.

C. rubrum

7 Tepals of lateral fruits fused to near apex,

leaves with usually only the basal lobes well developed

Red goosefoot



Saltisham

* Near sea & estuaries; bare patches in brackish grazing marsh; relic salt-marsh creeks

C. chenopodioides

Saltmarsh goosefoot

8 Leaf bases at least weakly cordate in some cases,
with pointed maple like lobes.

Arable weed, especially Brecks.

Archaeophyte (Maple-leaved goosefoot)

C. hybridum

Seed pitted

8 Leaf bases cuneate

9 Seeds keeled at edges, tepals minutely

denticulate, leaves with numerous pointed lobes (nettle like)

Arable. Archaeophyte V. scarce.

C. murale

Nettle-leaved goosefoot

9 Seeds not keeled at edge, but edges subacute to
obtusely rounded, tepals entire

10



Subacute Obtuse Rounded

10 Leaves entire or subentire

11

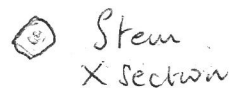
10 At least lower leaves distinctly toothed & / or lobed

12

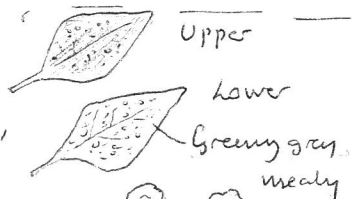
- 11 Leaves green or reddish green both surfaces, not mealy,
ovate-elliptic; Stems square in section (angled)



Archaeophyte; Many seeded . . . | C polysperum
Goosefoot; arable mainly SE border clay



- 11 Leaves greeny-grey, mealy, at least on lower surface,



Archaeophyte ovate-truncate; stems

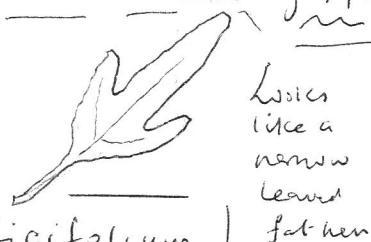
In Suffolk.

v. rare, usually
near sea.

Smelling of rotten fish . . .

| C vulvaria (Stink
goosefoot)

- 12 Leaves looking 3 lobed, with long forwardly
directed basal lobes & narrow central lobe
Archaeophyte (trifid)
Usually arable (road verges). Fiddleleaved
goosefoot

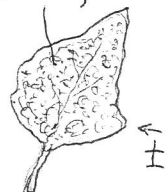


| C ficifolium

- 12 Leaves with very short, indistinct or
absent basal lobes (not trifid) . . . 13

- 13 Leaves not or little longer than wide, ovate-truncate,
not lobed or with only 2 short basal lobes, densely
mealy, leaves often fused to 1/2 way

Densely mealy



Athin. (Tips & waste ground; very rare,
collected now)



| C opulifolium Gray
goosefoot

- 13 Leaves distinctly longer than wide leaves fused to < 1/2 way

variously mealy . . . 14

- 14 Leaves shallowly lobed or toothed, sometimes with

Arable, wasteland
road verges; Native

indistinct basal lobes

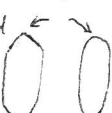
Seeds with

subacute edges in narrowest profile



| C album

- 14 Seeds with obtuse to rounded edge in narrowest profile



| C album
like
rarities

- (i) Plant often v tall (< 2m) | C probstii
usually red-purple stems
Distinct basal lobes Seeds ≤ 1.25 mm

- (ii) Plant v. tall & robust
(< 2 m)

Leaves enormous (< 14cm)
often red purple

Scarcely lobed C giganteum

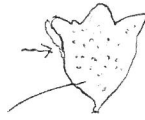
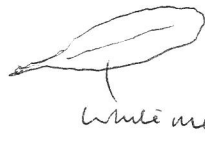
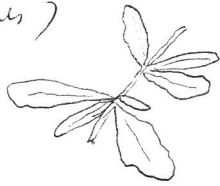
- (iii) Rarely red purple,
fairly short plant
Seeds ≥ 1.25 mm

Visual key to Norfolk Arthrop species

Bob Leaney Nov 2017

- ① Shrubs - To 1 metre, well branched, nearly always on edge of saltmarsh creeks, occasionally bases of sea cliffs or inundated promenades

(perennials)



Bracteole with 3 lobed tips

A. portulacaoides

(Sea Purslane; Native)

- To 2.5 metres, planted as wind break by sea & naturalised in Channel Islands, rare casual in far South to E Suffolk.

A. halimifolius

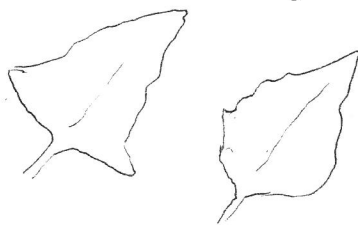
(Shrubby orache; Alien)

② Alien herbs

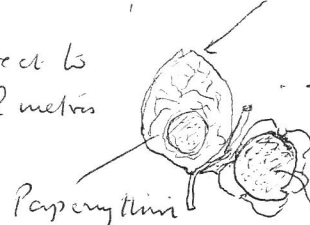
(annuals with papery thin bracteoles)

- & some ♀ flowers without bracteoles

Leaves green to purple both sides, obscurely or not dentate; bracteole tips obtuse



Erect to 2 metres



Papery thin

Naked fruit occ. garden escape

A. hortensis

(Garden orache)

Leaves whitish beneath, more coarsely dentate, bracteole tips acute, bases cordate.



A. sagittalis

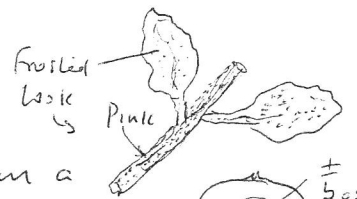
(Shining orache) Naked fruit (Salted road verge E Essex)

③ Native herbs

(annuals)

(Usual oraches)

- 1 Leaves greenish-silver, stems powdery pink, covered in a powdery deposit or "sugar crystals" on bracteoles (frosted); bracteoles thickened at base & hard (cartilaginous)



Frosted look

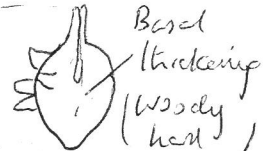
Pink

Fruit transverse elliptic

+ bossing

Virtually always mid beach with proclive community (Caulis etc)

Wider than long



Basal thickening (woody hard)

1

Leaves green

A. laciniata

(Frosted orache)

- (Sometimes turning red or yellow) or slightly greyish green from mealiness, but not silvery & stems not powdery pink; bracteoles herbaceous or thickened & spongy (not woody hard)

2

Visual key to Norfolk *Atriplex* species (Cont) :

2 All bracteoles sessile 3

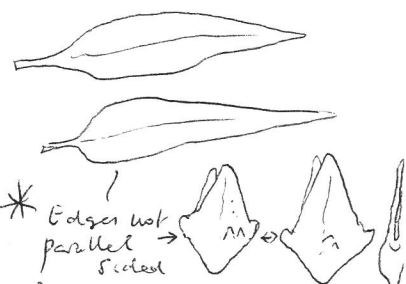
2 Some bracteoles stalked . . (especially axillary bracteoles) . . 7

3 All lower leaves without basal lobes . . 4

3 Some lower leaves with basal lobes 5

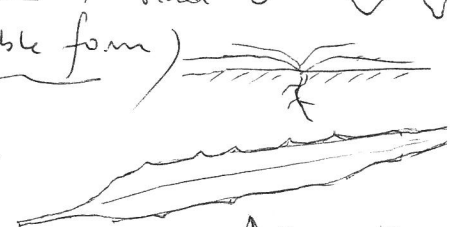


4 Lower leaves with convex and entire edges
bracteoles rhombic (diamond shaped) with
narrowly cuneate bases or most sparsely spiny & mealy



... | A. patula |
(prostraticarble form)

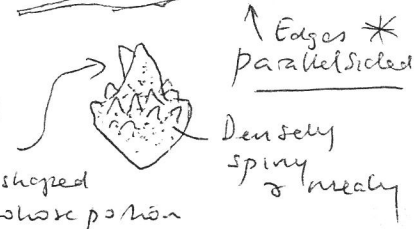
4 lower leaves with parallel sided
& usually dentate edges, bracteoles trullate
always densely spiny & mealy.



On upper beach, just above
beach, now abundant on
Salted main roads .

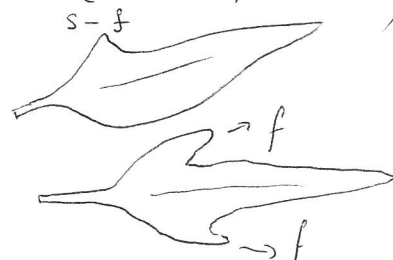
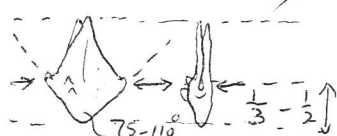
... | A. littoralis |

Narrowly tongue shaped
foliose portion



5 Lower leaves with narrowly cuneate to subcordate bases (basal angle $< 160^\circ$)
Basal lobes directed (sideway -) forwards, bracteoles
rhombic, base narrowly cuneate (basal angle $75-110^\circ$)

... | A. patula |



Usually inland, commonest arable species, also ruderal & on
Salted road verges, but Very rare near coasts & estuaries .

(NB.
Orchids with forward
pointing basal lobes
in saline conditions
likely to be *A. longipes*
or *A. x guss*)

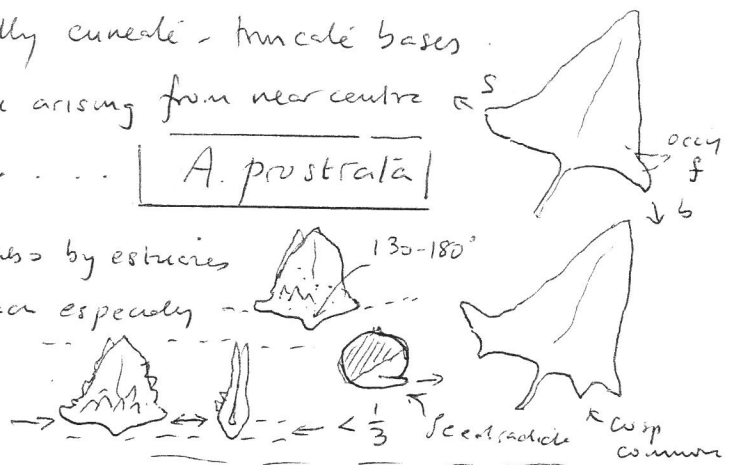
5 Some lower lobes with broadly cuneate to
subcordate bases (basal angle $160-220^\circ$), basal
lobes directed (forwards) sideways or backward; bracteoles
herbaceous with broadly cuneate to truncate bases or

basally thickened & spangy 6

Visual key to Norfolk *Athyrium* species (cont) :-

- 6 Bracteoles herbaceous, with broadly cuneate-truncate bases (basal angle $130-180^\circ$), seed radicle arising from near centre of base & directed $\pm$ laterally *A. prostrata*

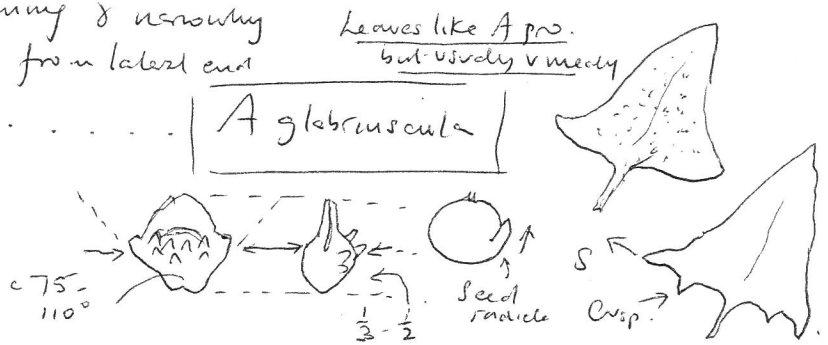
Most ubiquitous species inland & also by estuaries & coasts; commonest sp. on upper beach especially on shingle



- 6 Bracteoles with spongy basal thickening & narrowing cuneate bases; seed radicle arising from lateral end of base & directed upwards *A. glabrescens*

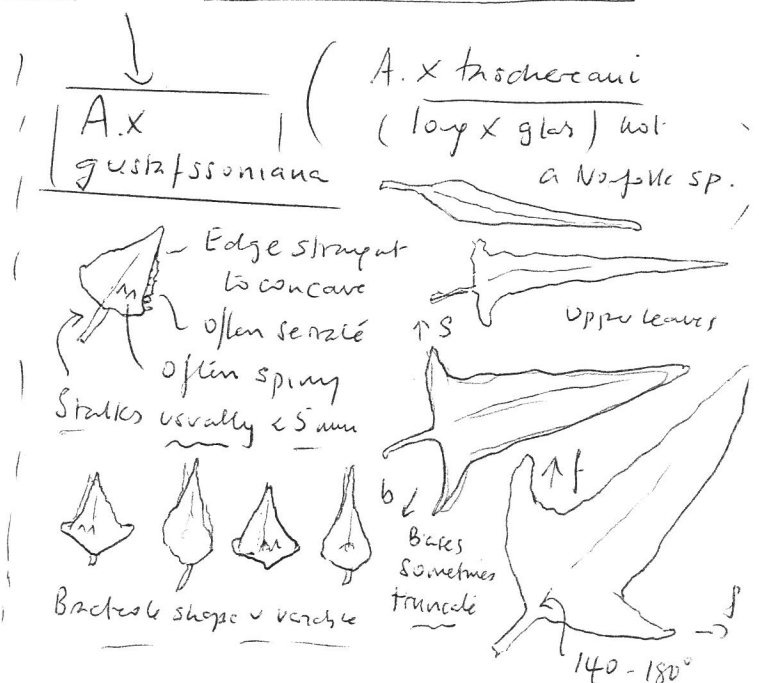
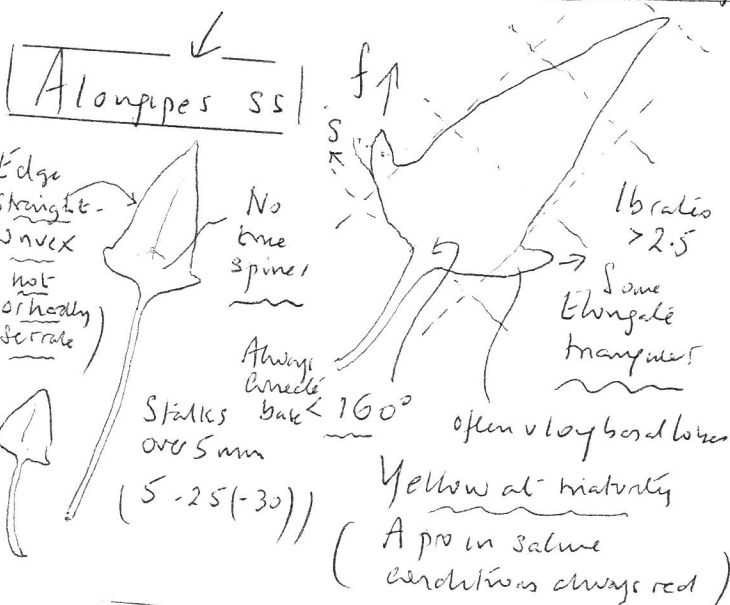
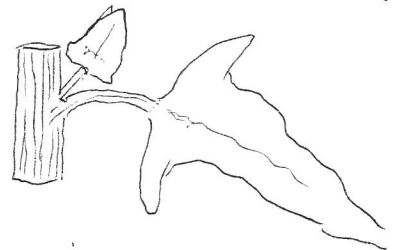
Leaves like *A. pro.* but usually very finely

On exposed beaches of sand or shingle on upper beach or just above, very infrequent on estuaries or salted roads



- 7 Some bracteoles stalked (especially axillary bracteoles)

Athyrium longipes complex ~ *A. longipes* ss & *A. x gust* often spotted by yellow colour at maturity, elongate triangular leaves & very long basal lobes ~ always in saline habitats



Both taxa usually found on silt at edge of river estuaries or coastal salt marsh; frequently associated with *Phragmites* on edge of brackish ditches, with *Elythria althetica*, or occasionally with *Tunus maritimus* or *Bulboschoenus*.