BROKEN PLURALS – OR INFIXES?
THE CASE OF THE ALGERIAN ARABIC OF DELLYS

LAMEEN SOUAG

Introduction
I propose a formal analysis of broken plurals in the Algerian dialect of Dellys (which I believe will be seen to have potential applicability to some degree in other North African dialects, although the dialect displays some clear differences) that describes them as simple, regularly placed infixes with a few vowel-modifying rules rather than, as is commonly done for other dialects, regarding them as mappings to particular patterns (cf., for instance, Heath 1987 for Moroccan Arabic; an extreme example can be seen in Harrell 1962, who describes about 40 different broken plural patterns, although that includes many reclassicizations.) This yields a more economical description, and clarifies the underlying connection not only between CCaC, CCaCəC, and CCaCV plurals (not to speak of longer ones, eg /wharna/ < /wəhrani/ 'Oranais') but also between what I would describe as infixed-a plurals, infixed-u plurals, and infixed-i plurals. As a bonus, it describes in detail an important part of the morphology of a never previously described urban dialect.

Most of the phenomena I describe would be described differently in the usual analysis: that is, of course, exactly the point. I would suggest that many or most North African dialects are undergoing a slow process of reshaping the plural system to better fit their reanalysis of what in Classical Arabic were unambiguously patterns as infixes; accordingly, I have described the plurals throughout as they appear in the latter view, which I believe helps highlight synchronic irregularities (often irregular only relative to this view) which are likely to be ironed out soon (such as the vanishing schwa-plural described later) and sometimes past irregularities which have already been ironed out (such as the Arabic /faʕaaliil-/ plural, which in some dialects is still /ffalil/ but in this one and many others has merged with /ffaləl/ < /faʕaalil-/, which fits the infix analysis much better.).

By way of background, Dellys is a small but rather old port town about seventy kilometres east of Algiers, first founded by the Carthaginians under the name of Rusucurru and attested in Roman geographies as late as the early Byzantine era and in Arabic geographies from at least the 12th century onwards (cf. al-Idrisi 1154, by whose time it was already flourishing); although it lies on the edge of Kabylie, it, like Bejaia, was already predominantly Arabic-speaking well before the French arrived, and unlike Bejaia it still is. It is said to have received a few Andalusi refugees after the *Reconquista*, as would be expected of a port town. It was under the poltical control of the Banu Thaʕlab, a branch of Banu Hilal that also controlled Algiers, immediately before the arrival of the Ottomans (according to Leo Africanus). In Ottoman times it was on the eastern edge of the beylik of Algiers, and

was in regular communication with that city; several surrounding Kabyle tribes such as the Beni Flisa and Beni Sliyem are described as having been allied with the town. Though it was described as a large town in earlier times, it failed to grow at the pace of the rest of Algeria, and has in large measure been supplanted as a regional centre by Tizi-Ouzou since the latter's foundation in the colonial era. There is wide variety in this town's dialect, as in most of modern Algeria – some resulting from the influx of rural immigrants during and after the war of independence, some resulting from heavy influence from Algiers (many former inhabitants have moved there and stay in regular contact with their relatives in Dellys) in more recent years, not to speak of the universal Maghrebi phenomena of reclassicization and the practice of sprinkling one's speech with French words to sound more chic – to the point that my father, my brother and myself, and some of my cousins, all brought up within the same small neighborhood of this small town, all show some distinct differences. Unless otherwise specified, this paper describes the dialect of my father, born there in 1945 and brought up on the outskirts of the town, in the neighborhood of Ladjenna, or Les Jardins, to whom I am very grateful for putting up with all my questions! Probably the biggest difference is that in his dialect labiovelarization is clearly phonemic, whereas younger speakers appear to have adapted this to a short vowel phoneme /ū/.

Phonology and transcription

For notation, this follows closely the guidelines set forth by Caubet 2000, but uses /ə/ rather than /e/ and notes labiovelarization by the symbol °; /j/ represents the affricate [dž]. All transcriptions are intended to be phonological unless otherwise indicated; in this dialect, /mw/ and /fw/ are, as in many other dialects, realized as [mm°] and [ff°] (although some words seem to allow both, eg /mwaləf/ = [mm°aːlĭf] or [mwɛːlĭf] indifferently; this may be restricted to cases like this one where the sequence emerges from prefixation), and /əy/ and /əw/ are normally indistinguishable from /i/ and /u/ (although reclassicization has slightly eroded this.)

For the purposes of the remainder of this paper, 'letter' will denote a consonantal phoneme or one of the long vowels /a, i, u/; the position or presence of /ə/ in the singular noun is entirely irrelevant to the formation of the infixed plurals, and within the plurals /ə/ is predictable by cyclic application of the rule CC > CəC / _{C, #}[1]

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[1]In generative phonological terminology. Less technically: starting from the end of a letter-only stem and moving backwards, we check each pair of letters in turn. If they are both consonants and are not followed by one of /a, i, u, ə/, we insert /ə/ between them, otherwise we do nothing. Thus, starting with /brkuks/:

/ks/ is 2 consonants, and has a space after it, so > /kəs/;

/uk/ is not 2 consonants, and even if it were it's followed by /ə/, so we do nothing;

/ku/ is not 2 consonants, so we do nothing;

/rk/ is 2 consonants followed by a vowel, so we do nothing;

/br/ is 2 consonants followed by a consonant, so > /bər/;

and we end up with /bərkukəs/.

starting from the end leftwards. In fact, there is a good deal of evidence that even in stems /ə/ is in most cases not phonemic but predictable (see for instance Harris 1951 or Heath 1987 for discussion of the issue as it applies to Moroccan Arabic, although neither of their conclusions would suffice for this dialect, which has cases such as /ʕənqrəb/ 'scorpion'); in most stems, and **all** infix plurals, it is generated by the rule described previously, and the remainder can be accounted for by assuming either a quite small number of lexical schwas, or (and the case of /tazrart/ 'small wasp', though unique and a clear loanword, suggest this latter) marking of certain consonants as syllable-final. /°/ denotes rounding associated with a consonant, usually but not always a reflex of Classical short /u/ next to a velar or uvular, which displays itself either by changing adjacent /ə/s to [ŭ] or, when no vowel is adjacent and it is not at the end of a word, as a very short [ʷ] (not found in most younger speakers); it is not a letter, but an element of a consonant. This dialect does not permit adjacent vowels.

Stress in this dialect, as in Algiers, falls either on the penultimate syllable (if the last syllable contains two letters) or the ultimate (if it contains three, ie CV:C or CəCC); since for many speakers the last C of a -CV:C or -CəCC group would in connected speech syllabify with the next word when possible (thus /w-mʕak lḥ°əbb sʕib/ > /wəm.ʕa.kəl. ḥ°əb.bəs.ʕib/ 'and love is difficult with you', to quote a Rabah Driassa song) this rule's phrasing can be simplified by regarding the final C of such cases as in fact a syllable onset (and the initial C of a word-initial cluster as a syllable final), and phrasing the rule as: stress falls on the vowel after the penultimate syllable-onset. This rule has no exceptions at all. Thus we get:

/ʕtá/, he gave
/ʕtína/, we gave
/ʕtinálək/, we gave you
/ʕtinahálək/, we gave you it
/ma ʕtinahalʃ̌kc/, we did not give you it
/ṣəbbúra/, blackboard
/bərkúkəs/, berkoukes (a kind of food made with very thick-grained couscous)
/ʕə̌nqrəb/, scorpion
/bəḷḷút/, acorn

Non-infix plurals
First of all, I should mention in passing the plural types which will not be relevant to my argument:

1. Very many nouns (including most diminutives and most recent loanwords; older loanwords frequently take the infix-a plural), especially ones ending in the feminine suffix /-a/, take plurals by suffixing /-at/, eg:

| /nhar/ | /nharat/ | 'day' |
| /mərra/ | /mərrat/ | 'time' |

This may seem complicated written out at such length, but cylically applied rules are well-attested for many languages, and widely accepted as necessary.

When the noun ends in a vowel, a homoganic semivowel is inserted; thus

    /tiyu/   /tiyuwat/   'hoses' for instance.

A few irregular /-at/ plurals

    /asəm/   /smawat/   'name'
    /bṛiya/   /bṛawat/   'letter'
    /ḥəlwa/   /ḥlawa/   'sweet'

do exist, but I will not try to explain it. Two combination plurals involving /-at/ are explained below. All other /-at/ forms seem to be regular.

2. In this dialect, unlike some others, almost no nouns take a plural simply by adding /-a/, apart from a few nisba nouns such as /bjawi/ 'Bejaian' > /bjawiya/.

3. Most adjectives and a few nouns (mainly but not exclusively certain nisba nouns, and nearly all actor nouns with the pattern /fəʕʕal/) take plurals by suffixing /-in/ (distinct from the dual /-in/, which becomes /-i-/ before a possessive suffix); these are of interest only insofar as they are sometimes used to avoid an unacceptable result of the infix plural, as will be seen below. Examples include:

    /xəyyaṭ/   /xəyyaṭin/   'tailor'
    /dzayri/   /dzayriyin/   'Algerian'

4. Many substances – fruits, vegetables, animals, materials – have (unmarked) masculine collectives or mass nouns versus (marked) feminine count nouns, eg /nəmla/ '(a single) ant', /nməl/ 'ants', or /bəxsisa/ 'a fig', /bəxsis/ 'fig' (as in 'fig tree', or 'fig jam') or 'figs'. Such nouns have both a collective and a sound feminine plural form, the former covering most functions of the plural, but the latter being used mainly with the numbers from 2 to 10, eg /biḍa/ '(single) egg', /biḍ/ 'egg (material), eggs (treated as mass)', /biḍat/ 'eggs'. The semantics of this would be well worth investigation, but the morphology is uninteresting for this paper's purposes.

5. Some body parts (including some that don't come in pairs, eg /ṣbəʕ/ 'finger' > /ṣbəʕtin/ 'fingers'; despite its meaning, this is morphologically the dual and not the plural /-in/ because, for instance, 'his fingers' is /ṣbəʕtih/ and not */ṣbəʕtinu/) normally take the dual /-in/ (which on other words in this dialect is used in addition to the plural, eg /wərqa/ 'leaf/paper', /wrəqtin/ 'two leaves/sheets of paper', /wərqat/ 'leaves/sheets of paper', /wrəq/ 'paper/leaf as a material') as their only plural. Note also that the dual is usually /-in/, eg /ʕin/ > /ʕinin/ 'eyes', but sometimes /-tin/ as with /ṣbəʕ/, no doubt to be interpreted as a dual of an unattested feminine count form.

6. Suppletive plurals – eg /mṛa/ 'woman' > /nsa/, or /bnadəm/ 'person' > /nas/ as well as /bni-adəm/ – are also occasionally found. (These both have rarer regular forms /mṛa/ 'woman' > /mṛawat/, /bnadəm/ 'person' > /bnadmat/.)

Generalizations
While, in the infix-a plural, three-letter nouns treat a final /-a/ that otherwise behaves like a normal feminine[2] ending as a part of the stem, most drop any previously existing feminine endings in infix plural formation. As pointed out earlier, it should be understood throughout that only the letters of the noun are input into the plural-forming rule(s).

The generalizations I will make are the following:

1. Most of the so-called 'broken plurals' of this dialect are in fact vocalic infixes (which are always inserted directly after the second letter) governed by simple, regular, and usually well-motivated rules;
2. /ə/ is irrelevant to the input of plural formation, and assigned by an exceptionless rule to the output;
3. The plural infix must be stressed, a convention presumably motivated by the desire to minimize confusion with the singular;
4. This dialect has an exceptionless stress-placement rule (this combined with the previous offers a synchronic explanation for the deletion of short vowels after the infix);
5. Vowels and semivowels may be elided under some circumstances, but never consonants.

Infix-a plurals
The essential basis for the commonest plural type in this dialect for masculine nouns – also applied to some feminine ones – is formed by infixing stressed /-a-/ after the second letter. This immediately forces adjacent vowels to become semivowels, given that vowels are not allowed to be adjacent to each other; it also forces us to eliminate any non-final vowels after the infix to place the stress as required, and tells us that this plural form will be severely problematic for nouns with more than 3 consonants after the second letter. However, the fact that final vowels get ablauted is not predictable from this, and appears to be something of a historical accident.

Loanwords always seem to take either this plural or the plural in /-at/, further suggesting that these are the default plurals (apart from loanwords of the shape CaC, which take the -an plural; eg /kaṛ/ > /kiṛan/ 'bus'.)

The simplest examples motivating this claim are those in which only the infixation is relevant, and no vowels (except of course /ə/) need to be cleaned up:

/kəbš/	/kbaš/	'sheep'
/wləd/	/wlad/	'boy'
/məx°x°/	/mx°ax/	'mind'
([moxx]	[m°xɑ:x] phonetically)	
/bəṛ°j/	/br°aj/	'tower' (pronounced like previous)

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[2]Clearly, this suffix has many functions, of which mere sex marking is if anything the least important (cf. Caubet 1993); I term it 'feminine' throughout this paper for convenience's sake alone.

/aləf/	/alaf/	'thousand'
/zəlzla/	/zlazəl/	'earthquake'
	/zəlzlat/	
/teʕləb/	/tʕaləb/	'fox'

No five or more-consonant words that I am aware of have ablaut plurals; there are very few such words in any case, and those that I know of (eg /ʕənqrəb/ 'scorpion', /qrəmfəl/ 'cloves', /ṣfərjəl/ 'quince', /k°ərk°əbbəʕ/ 'dung beetle') do not – and, it appears to my semi-native intuitions, could not – take this plural. For six or more-consonant words, the aforementioned condition that the plural infix must remain stressed, combined with a prohibition on deleting consonants for any reason, rule out infix plurals; for 5-consonant words, one might try to block them by blocking the somewhat anomalous, although permissible, CVC syllables (where V is long), but cases such as /tambər/ 'stamp' > /twambər/ rule that solution out.

There is one slightly irregular case: [fomm] 'mouth', a word somewhat anomalous phonologically but probably to be analyzed as /fwəmm/, takes the plural /fwam/ [ff°a:m], formed from the nonexistent */fwəm/ (which also gives us the diminutive /fwiyem/ [ff°iyyĭm] or /fwima/ [ff°imə] .) Although beyond the scope of this paper, it is interesting to note that diminutives have also adopted a system of infixing a fixed vocalic element (/-iy-/ or /-i-/) after the second letter, with most of the same resulting vowel transformations as for infix-a plurals, and this fact seems to constitute further support for this analysis.

The next simplest are those in which non-final vowels after the infix have been deleted as expected, thus keeping the stress on the infix:

/məlyun/	/mlayən/	'million'
/təṣwira/	/tṣawər/	'picture'
	/təṣwirat/	
/qərniṭ/	/qranəṭ/	'octopus'
/ṣəbbaṭ/	/ṣbabəṭ/	'pair of shoes'

And word-finally, the rule /i/ > /a/ is clear:

/wəhṛani/	/whaṛna/	'Oranais'
	/wəhṛaniyin/	
/dəllsi/	/dlalsa/	'Dellysien'
/ṭəbṣi/	/ṭbaṣa/	'plate'
/k°ərsi/	/k°rasa/	'chair' (a clear case of leveling to fit this rule; contrast classical /karaasii/)
/šadi/	/šwada/	'monkey'
/gumi/	/gwama/	'*harki* (person who fought for the French in the war of independence)'
/zərbiya/	/zṛaba/	'rug'

For some speakers, this /a/ becomes /t/ in annexion (eg /k°rasti/ 'my chairs'), suggesting that it is in fact the feminine ending /-a/ rather than a plain /a/, odd as this

might seem at first sight.[3] However, my father finds such a form unacceptable, and would prefer either a plain vowel /k°rasaya/ or just to avoid it entirely by using an external genitive.

There seems to be only one surviving exception to the rule:

/dərri/   /drari/   'child'

But the singular is nearly obsolete in this dialect (although the plural is common), so this need not worry us unduly here; in fact, it is tempting to cite this as an irregularity in the infix-a plural being ironed out.

Not many nouns end in /u/; most of them seem to be insect names or recent borrowings, and none, as far as I know, take a normal infix plural in this dialect. Neither /ḍu/ 'light' nor the even less regular /xu/ 'brother' offers clear evidence.

As previously mentioned, most nouns that end in the feminine /a/ lose it, but if the noun has only three other letters, it regularly becomes /i/:

/taqa/	/twaqi/	'window'
/lila/	/lyali/	'night'
/bəlġa/	/blaġi/	'sandal' (not to be confused with /bliġa/ 'flip-flop' >
		/blayəġ/ below)
	/bəlġat/	
/ẓəʕka/	/zʕaki/	'tail'
	/ẓəʕkat/	
/ʕəfsa/	/ʕfasi/	'trick'
	/ʕfayəs/	(used by younger speakers, under Algiers influence)
	/ʕəfsat/	

If we now examine ones with a vowel before the infix, /u/ becomes /w/, logically enough; /i/ appears to become /y/ in general, but occasionally in longer words becomes /w/, under the influence of the other two vowels' behaviour:

/ʕid/	/ʕyad/	'festival'
/sif/	/syaf/	'sword'
	/syuf/	
/šiṭan/	/šyaṭən/	'devil'
/bidun/	/byadən/	'trash can'
/jijli/	/jwajla/	'Jijeli'
	/jijliyin/	
/ʕud/	/ʕwad/	'horse'
/ṣuṛ/	/ṣwaṛ/	'wall'
/tunsi/	/twansa/	'Tunisian'

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[3]Caubet 1993 explains this for nisba nouns as a collective analogous to certain dialects' /-a/ plural for actor nouns; but while this is clearly the historical explanation, it has no such synchronic motivation within this dialect, where /-a/ almost nowhere else serves as a human collective marker, and is much more frequently a decollectivizing marker. Neither can it explain the extension of this plural to non-nisba nouns ending in /-i/.

However, the isolated example of

/yum/   /yyam/   'day'

shows that this is overridden by an preceding semivowel. (We cannot simply postulate /yw/ > /yy/, because one word, /aywa/ 'yeah', has this sequence – also, it arises by prefixation in such cases as /y+waləf/, 'he gets used to'.)

For /a/, the situation is more complicated; in 3-letter nouns both are attested, but in longer ones only /w/ is found. Moreover, CaC nouns (even borrowings) usually take a different plural (/-an/; see below), so one could argue that taking this plural form is irregular for them in any case. I would suggest that /a/ > /w/ is regular for this position, and that /daṛ/ is an irregular form.

/daṛ/	/dyaṛ/	'house'
	/dyuṛ/	(used mainly by younger speakers)
/ʕam/	/ʕwam/	'year'
/xatəm/	/xwatəm/	'ring'
/ḥanut/	/ḥwanət/	'shop'
/maʕun/	/mwaʕən/	'dishes'
/qaduma/	/qwadəm/	'adze'
/tambəṛ/	/twambəṛ/	'stamp'

Note that

| /ṛajəl/ | /rjal/ | 'man' |
| /ṣaḥəb/ | /ṣḥab/ | 'friend' |

together constitute an irregular class in this dialect (the former even includes a consonant change.) CaC-a nouns pose an interesting problem, but one that is best considered after seeing what happens to vowels after the infix.

Note also that

/tambəṛ/   /twambəṛ/   'stamp'

shows the dominance here of the infix-interpretation; Heath 1987 reports that /ṣandala/ > /ṣnadəl/ or /ṣwandəl/ in Morocco, depending on the dialect, and whereas the former type more or less requires a mapping interpretation, the latter is more easily explained with the infix interpretation.

After the infix, all three vowels become /y/:

/jnan/	/jnayən/	'garden'
/pḷaṣa/	/pḷayəṣ/	'place'
/bliġa/	/blayəġ/	'flip-flop'[4] (in my and my brother's speech, but not

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[4]Although many dialects do not allow infix plurals of diminutives (cf. Caubet 1993, for example), it appears that this one sporadically does for younger speakers: contrast /bəlġa/

my father's, who says
                /bəlġat/)
/ʕjuza/   /ʕjayəz/   'old woman'

This is encouragingly reminiscent of their behavior after another infixed -a-: in active participles, where /a/ is inserted after the first letter of a trilateral (eg /k°təb/ > /katəb/ 'writing, writer'), all three vowels go to /y/ if they come after the infix (/dir/ > /dayər/ 'doing', /šuf/ > /šayəf/ 'seeing', /ban/ > /bayən/ 'apparent'.) Unfortunately, this infix never appears in a position where it would have a preceding vowel.

Note that, while some dialects are reported to have the irregular plural /jnaḥ/ 'wing' > /jnawəḥ/, this one instead uses the dual /jnaḥ/ > /jnaḥtin/, in another apparent case of leveling. Another relic of such a form is found in the two genitive particles /taʕ/ (also /ntaʕ/, /mtaʕ/) and /dyal/, plurals /tawəʕ/ (respectively /ntawəʕ/, /mtawəʕ/) and /dyawəl/ (/taməʕ/ and /dyaməl/ in my cousin's speech.)

Seemingly, vowels after the infix can disappear when they would result in a closed long syllable ending in a semivowel, as the following cases in my and my brother's speech illustrate:

/mxidda/   /mxadəd/   'pillow'
/mxədda/
/mġirfa/   /mġarəf/   'spoon'

However, my father would make these:

/mxədda/   /mxəddat/   'pillow'
/mġ°ərfa/   /mġarəf/   'spoon'
/mġirfa/   /mġirfat/   'spoon'

revealing that these are very recent relics of the plurals of their respective non-diminutives. However, the second of these non-diminutives is not found in my or my brother's speech, and the first sounded wrong to my brother, although it was familiar to me; so we seem to have a case of a change in action.

Some, especially Bedouin, dialects retain the more classical forms /mxadid/ etc. for several cases, which would rather complicate my analysis; the fact that it has been ironed out here is thus another encouraging sign that the infix analysis may have some psychological reality for this dialect. Only one is found, as far as I have been able to find, and it is a clear reclassicization, including an irregular extra /n/:

/dinar̩/   /dnanir̩/   'dinar'

Finally, we have the following strange set:

/ḥaja/   /ḥwayəj/   'thing' (pl. normally means 'clothes')

'sandal' > /blaġi/. See also the paragraph after next. However, the normal diminutive plural, irrespective of gender, is in /-at/.

/saʕa/	/swayəʕ/	'hour'
/ʕəfsa/	/ʕfayəs/	'trick' (for some younger speakers)
	/ʕfasi/	
	/ʕəfsat/	
/jiha/	/jwayəh/	'direction' (pl. means 'about, roughly')

It is tempting to simply dismiss these three cases as irregular; but, particularly given that the second and third do not take this plural in Classical Arabic, it would be nice to find a better motivation. In fact, these are quite regular if interpreted as plurals of diminutives: /ʕəfsa/ > /ʕfisa/ > /ʕfayəs/, /jiha/ > /jwiha/ > /jwayəh/, etc. However, they are clearly now fossilized forms in any case (as the meaning changes of some of them support), and are even more so in dialects which no longer take the infix-a plural for diminutives. It is also worth noting that all attested examples are three letters plus the feminine suffix; this suggests the alternative interpretation that the extra /y/ is added simply as a slightly irregular way to make sure the plural is longer than the singular, or is metathesised from the expected final /i/.

There are very few 2-letter words to work with:

/ḍu/	/ḍwawat/	'light'
/ma/	/myah/	'water'
/xu/	/xawa/	'brother'
/x°t/	/xwatat/	'sister'

pretty much covers it. The first and fourth are clear double plurals; /ḍu/ > /ḍwa/ by application of the semivowel change (giving -ua- > -wa-) pluralized again, with a helping semivowel inserted (as with /mra/ > /mrawat/) > /ḍwawat/, and /x°t/ reanalysed as /xwət/ > /xwat/ > /xwatat/. /ma/ gives another example of an infix-a plural where /a/ before the infix > /y/, slightly irregularly; the /h/ is entirely irregular, as in its Classical form, but fills out what would otherwise be an anomalous ending. /xu/ cannot be analyzed as regular by any means in this dialect, despite its tempting similarity; some other dialects have /xa/, and we might postulate that /xawa/ emerged by adding a feminine suffix to this, but it still looks odd.

/dəmm/ 'blood' does not normally take a plural in local (and indeed general) usage, but my father said he might have heard /dmami/ somewhere. However, this would have to be confirmed; if so, it would clearly be a regular plural of ʔ/dəmma/, which I have never heard myself but which would logically mean 'a drop of blood', and which (unlike 'blood') would be a countable noun. (Compare /dəbza/ ' a blow' > /dbazi/, which my brother produced the other day.)

Note also that most familiar place nisbas can take the infix-a plural:

/mġərbi/	/mġarba/	'Moroccan'
/tunsi/	/twansa/	'Tunisian'
/wəhṛani/	/whaṛna/	'Oranais'
	/wəhṛaniyin/	
/ṛumi/	/ṛwama/	'European, Westerner'
/sufi/	/swafa/	'person from Wadi Suf'
/jijli/	/jwajla/	'Jijeli'

/jijliyin/

But many not only do not, but it seems intuitively that they could not:

/dzayri/	/dzayriyin/	*/dzayyra/	'Algerian' (also /dziri/, etc.)
	/dzayriya/		'Algerian'
/stayfi/	/stayfiyin/	*/stayyfa/	'Setifien'
/bjawi/	/bjawiya/	*/bjaywa/	'Bejaian'

Such cases could be blocked by a rule stating that plurals that would involve two adjacent semivowels after the infix cannot be formed.

Also,

/qsəntini/   /qsəntiniyin/   'Constantinian'

illustrates the stress rule again; the infix-a plural according to the usual rules would be */qsanẽtna/, with stress in the wrong place.

Infix-u plurals

Other types of infix plural are much rarer and usually more restricted in their application, but should be covered for completeness' sake. Infix-u plurals, unsurprisingly, infix /u/ after the second letter, and occasionally add feminine /a/ at the end, eg:

/gəṛn/	/gṛun/	'horn'
/xədd/	/xdud/	'cheek'
/šhər/	/šhuṛ/	'month'
/fsəl/	/fsul/	'season'
/kərš/	/kruš/	'stomach'
/qəlb/	/qlub/	'heart'
/sbəʕ/	/sbuʕa/	'lion'
/bit/	/byut/	'house'
/bir/	/byur/	'well'
/šix/	/šyux/	'old man'
/ktab/	/ktub/	'book'
/taləb/	/tulba/	'student'[5]

They are unattested for words with more than 3 consonants; the evidence on their vowel changes is rather insufficient, but in the light of the previous discussion we can interpret it as follows:

/bit/   /byut/   'house'

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[5]This has a phonetically short u and is probably to be seen as /tŭlba/ for younger speakers (who would probably use the reclassicization /tŭllab/ anyway); however, there is a strong tendency to shorten vowels before two consonants (for instance, the /a/ of /ṣaḥbi/ 'my friend' or /dayrin/ 'doing (pl.)' or the /u/ of /qullu/ 'tell him' are clearly much shorter than in /ṣaḥəb/ 'friend' or /dayər/ 'doing' or /qul/ 'say') and phonemic short /ŭ/ would be structurally very hard to accommodate in my father's dialect.

/šix/	/šyux/	'old man'
/taləb/	/tulba/	'student'
/daṛ/	/dyuṛ/	'house' (rare in my father's dialect, but commoner
for		
		younger people)
	/dyaṛ/	

we see that before the infix the same vowel transformations apply as in infix-a plurals; the impermissible sequence /wu/ is then contracted to /u/. There is no evidence for words with /u/ before the infix; I would surmise that if permitted at all, it would have to become /y/ (otherwise we would get CuC > CwuC > CuC, which would be indistinguishable from the singular) but it seems more reasonable to suggest that it would simply take a different plural.

After the infix, we suggest on the basis of analogy and of the sole example

/ktab/	/ktub/	'book'

that /a/ > /w/ and /uw/ is contracted to /u/; we might surmise by analogy that /i/ and /u/ would go to /w/ as well, but /u/ > /w/ would clearly lead to confusion, and we have no evidence. The alternative suggestion of ablaut is clearly not encouraged by the case of /šix/ > /šyux/.

Schwa plurals
Finally we have three rare, possibly linked plural types. The first, which is rare and may be vanishing (judging by the variety of alternative plurals available for words that take it), seems to involve deletion of any /a/ and reapplication of the schwa-insertion rule, with optional added /-a/:

/qətt/	/qtət/	cat
	/qtut/	(only this one is used by younger speakers)
/čappa/	/čpəp/	hoe
	/čwap/	
	/čappat/	
/zawya/	/zwi/ (=/zwəy/)	zaouia (traditional religious school)
/triq/	/tṛ°əq/	road
	/təṛ°qan/	
/ġ°ṛab/	/ġ°əṛba/	'crow'

In fact, of the first three, only the third was repeated on a second elicitation, which however did produce the additional form /tṛ°əq/.

Infix-i plurals
The second is equally rare but more stable, and is produced by infixing /i/ after the second syllable and deletion of any resulting subsequent /y/:

/ḥmaṛ/	/ḥmiṛ/	'donkey'
/ʕsa/	/ʕsi/	'stick'
/məʕza/	/mʕiz/	'goat' (singular means 'nanny-goat', but /mʕiz/ used

for mixed groups only; 'nanny-goats' is /məʕzat/)

/bən/	/bni/	'son' (only found in /bnadəm/ 'human' and family names, so of dubious value)

/ləhya/ > /lhi/ 'beard' is questionable; it could be regarded as a normal count/mass pseudo-plural rather than as an example of this (since removing the feminine gives you /lhəy/, which in this dialect is indistinguishable from /lhi/), although the semantics of that would be odd.

Suffix-an plurals

The third involves suffixing /-an/; before doing so, long vowels get ablauted to /i/ in 2-consonant words, but in longer words all long vowels are lost:

/bab/	/biban/	'door'
/kas/	/kisan/	'pitcher'
/ṛaṣ/	/riṣan/	'head'
/jaṛ/	/jiran/	'neighbor' (slightly irregular)
/ġar/	/ġiran/	'cave'
/ḥiṭ/	/ḥiṭan/	'wall'
	/ḥyuṭ/	
/ʕud/	/ʕidan/	'stick'
/ṭriq/	/tər°qan/	'road'
	/tṛ°əq/	
/blad/	/bəldan/	'country'
/ġ°zal(a)/	/ġ°əzlan/	'gazelle'
/ʕdu/	/ʕədyan/	'enemy'

It is tempting to regard this as a combination of the previous two, applying the schwa plural on three-consonant nouns and the infix-/i/ plural on others before adding /-an/; however, this would require us either to ignore the evidence from 3-consonant nouns that the /i/-plural is an infix and describe it as a sort of ablaut, or to assume that long vowels > /y/ before the infix, and impermissible /yi/ > /i/ (which is not an unreasonable hypothesis, but for which no evidence is provided except in the /-an/ plural). However, the evidence is insufficient to draw any firm conclusion.

Conclusions

To recapitulate, a regular infix-a plural is formed by:

1. removing all schwas, and (unless the input contains 3 other letters or less) the feminine suffix /a/;
2. infixing /a/ after the 2nd letter;
3. changing preceding /a/, /u/ > /w/, /i/ > /y/;
4. changing following /a/, /i/, /u/ > /y/;
5. changing a final /i/ > /a/, /a/ > /i/;
6. deleting any remaining vowels after the infix;
7. reinserting schwas by cyclic leftwards application of CəC / _{C, #}

Infix-u and -i plurals are formed similarly (with /y/ and /w/ for infix-u, or /y/ and /y/ for infix-i, in lines 3 and 4), but require additional, plural-specific shortening

rules /wu/, /uw/ > /u/ and /yi/, /iy/ > /i/; they are thus less regular, from this perspective (and not from a pattern perspective, in which all patterns can only be seen as equal) which helps explain why they are rarer. Schwa plurals, which involve neither infixing nor suffixing, are structurally anomalous; and, as this analysis would suggest, they seem to be vanishing. Plurals in /an/, on the other hand divide into two types: those that combine /i/-infixing and suffixing, which are structurally normal and seem to be doing fine, and those that combine schwa-plural and suffixing, which are slightly anomalous but less so than plain schwa-plural, and are thus rarer than /i/-/an/ plurals but commoner than schwa-only plurals.

This analysis of North African plurals has a particular historical interest for the light it sheds on the Arabic 'broken plural'; the plural system described here emerges with only relatively minor changes from Arabic's much more complicated one simply by merging all short vowels and regularizing their positions, a well-attested and mostly regular sound change that affected the entire lexicon of most North African dialects west of Tunisia. That that should be the case is surely suggestive of a fact that is bound to have occurred to any methodical foreign learner of Arabic: the Arabic broken plurals themselves derive mainly from long vowels infixed in fairly predictable positions! The story of how the short vowel changes spread to the rest of the word would be interesting – and surely complicated - but this suggests a possible way out of the old dilemma of how such an astoundingly complex system as Classical Arabic broken plurals could have developed. It may also help explain the development of the plural systems of other North African dialects to regard them as intermediate points in a slow and ongoing reanalysis of a root-pattern system (like Classical Arabic) as an infix system.

Appendix: Animal names and their plurals
By way of an appendix and a set of examples, I add here all the animal names with plurals or collectives that we knew that my father and I could come up with off-hand using a book of Mediterranean wildlife and our memories. Most of this material is already available from Souag 2000 (http://www.geocities.com/lameens/darja/) in addition to a much larger number of animals whose plurals I have not recorded. Collectives are not included, although most of the /-at/ plurals at least also have collectives. Irregularities have been flagged with a §.

Suffix-at:

bəgṛa	bəgṛat	'cow'
nəʕja	nəʕjat	'ewe'
	nʕaj	
xṛufa	xṛufat	'female lamb'
qəlwaša	qəlwašat	'female kid'
qliwša	qliwšat	'young female kid'
sridək	sridkat	'young rooster'
jaja	jajat	'hen'
jwija	jwijat	'young hen'
flilsa	flilsat	'young chick'
fliləs	flilsat	
fəllusa	fəllusat	'chick'
ṭubba	ṭubbat	'rat'
buslama	buslamat	'dolphin'

bufərtuṭṭu	bufərtuṭṭuwat	'butterfly'
bujəġləllu	bujəġləlluwat	'snail'
məʕza	məʕzat	'nanny-goat'
ġ°zala	ġ°zalat	'female gazelle'
ṭems	ṭemsat (?)	'seal'[6]
ʕənqərba	ʕənqərbat	'scorpion/scorpionfish'
ʕəṣfura	ʕəṣfurat	'bird'
jṛana	jṛanat	'frog'

Infix-a:

ʕəjmi	ʕjama	'un-castrated bull'
wəkrif	wkarəf	'calf'
nəʕja	nʕaj nəʕjat	'ewe'
kəbš	kbaš	'sheep'
ʕətrus	ʕtarəs	'billy-goat'
qəlwaš	qlawəš	'male kid'
sərduk	sradək	'rooster'
ʕud	ʕwad	'horse'
kəlb	klab	'dog'
təʕləb	tʕaləb	'fox'
đib	đyab	'jackal/wolf'
zərdi	zrada	'weasel'
šadi	šwada	'monkey'
ḥəlluf	ḥlaləf	'pig'
gnina	gnayən	'rabbit'
ḥnəš	ḥnaš	'snake'
fəkṛun(a)	fkaṛən	'turtle'
ʕəṣfuṛ	ʕṣafəṛ	'bird'
qəṛniṭ	qṛanəṭ	'octopus'
qənfud	qnafəd	'hedgehog'

Infix-u:

qəṭṭ(a)	qṭuṭ	'cat'
	qṭəṭ	
sbəʕ	sbuʕa	'lion'
ṭiṛ	ṭyuṛ	'bird' (mainly in combinations, eg /ṭiṛ əlbḥəṛ/ 'seabird')
buq	bwaq	'conch'

Infix-i:

məʕza	mʕiz	'goat' (strictly speaking, a collective, like English 'cattle')
ḥmaṛ	ḥmiṛ	'donkey'

Suffix-an:

xṛuf	xərfan	'male lamb' §de-emphasis of r

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[6]There was some uncertainty about the plural, probably because seals have been locally extinct since my father's childhood and the word survives only in a few set expressions.

far	firan	'mouse'	de-emphasis of r	.
ġ°zal(a)	ġ°əzlan	'azelle'		

Schwa:

qəṭṭ	qṭəṭ	'cat'
	qṭuṭ	

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