
appendix 4: catalogue of non-metric traits - deciduous dentition

the title corresponds to the trait number on the data recording form and to its name

a summary of traits is presented on the following page: traits 1-26 are observed on the maxilla and traits 27-52 on the mandible

we have intentionally sub-divided the presentation of certain traits, when they are recorded on opposed quadrants

the catalogue contains six headings for each trait:

synonymous terms

the different terms encountered in the literature

references

useful references for description of the traits

application

this heading presents the teeth on which the trait is observed

definition

a brief description of the trait is given, largely based on or simply a translation of that given by the author who first defined the trait

data recording system

the data recording system selected for documenting observations; we also note here any changes in the recording system used, typically a simplification of the gradation of a trait

gradation

the gradations presented here are in general those retained in the recording system used

- | | |
|-------------------------------------|--------------------------------------|
| 1 - radical number | 27 - radical number |
| 2 - enamel line | 28 - enamel line |
| 3 - dilaceration | 29 - radiculæ appendiciformes |
| 4 - radiculæ appendiciformes | 30 - incisors and canine root number |
| 5 - incisors and canine root number | 31 - molar root number |
| 6 - canine root section | 32 - radix Citroen |
| 7 - molar root number | 33 - radix paramolaris |
| 8 - radix Carabelli | 34 - idiopathische radices |
| 9 - radix paramolaris | 35 - radix entomolaris |
| 10 - idiopathische radices | 36 - incisors incisal border |
| 11 - incisors incisal border | 37 - double lingual tubercle |
| 12 - talon cusp | 38 - cusp number |
| 13 - shoveling | 39 - protostylid |
| 14 - tuberculum dentale | 40 - anterior fovea |
| 15 - cusp development | 41 - split distostylid |
| 16 - metacone crest | 42 - mid trigonid crest |
| 17 - parastyle | 43 - distal trigonid crest |
| 18 - Carabelli's trait | 44 - deflecting wrinkle |
| 19 - metacone | 45 - hypoconulid |
| 20 - hypocone | 46 - entoconulid |
| 21 - metaconule | 47 - metaconulid |
| 22 - distal accessory tubercle | 48 - tuberculum paracone |
| 23 - mesial paracone tubercle | 49 - tuberculum Citroen |
| 24 - mesial accessory tubercle | 50 - fovea posterior |
| 25 - protoconule | 51 - trigonid furrow |
| 26 - lingual paracone tubercle | 52 - cervical prominence |

1 - radical number

Synonymous terms
none

References

Turner (1967), Turner et al. (1991), Scott & Turner (1997), Sciulli (1998)

Application
all teeth

Definition

the number of divisions (radicals) created by the developmental grooves, which may partition a root; the latter can be separated by these divisions or not

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

1. one radical, no developmental grooves
2. two radicals: 2 developmental grooves and 1 root or 2 roots with no developmental grooves
3. three radicals, 3 developmental grooves and 1 root or 1 root with no developmental grooves and 1 root with 2 developmental grooves...
4. four radicals, as above
5. five radicals, as above
6. six radicals, as above
7. seven radicals, as above
8. eight radicals, as above

2 - enamel line

Synonymous terms
none

References

Jørgensen (1956)

Application
all teeth

Definition

cervical crown margin extension at a root furcation (exclusion of the recording of enamel pearls), trait recorded on the buccal side only

Data recording system

Jørgensen (1956)

this system suggests a five-grading graduation, this trait is here recorded on a three-grading graduation

Gradation

0. none, no enamel extension
1. curved enamel extension
2. enamel extension extends over the greater part of the buccal surface
3. V-shaped enamel line (divided into 2 occlusally convex parts)

3 - dilaceration

Synonymous terms
labial deflection

References

Jørgensen (1956), Schulze (1987), Sciulli (1998)

Application
i¹, i²

Definition

curve of the root

Data recording system

Jørgensen (1956)

Gradation

0. no curve
1. root incurved distally
2. root incurved buccally

4 - radiculæ appendiciformes**Synonymous terms**

none

References

Schulze (1987), Alt (1997), Alt et al. (1998)

Application

i¹, i², c⁻

Definition

small additional root - or radice- which is often located, but not always, close the junction of the roots

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

0. absence
1. presence

5 - incisors and canine root number

Synonymous terms
none

References

Jørgensen (1956), Sciulli (1998)

Application

i¹, i², c⁻

Definition

incisors and canine root number

Data recording system

Jørgensen (1956)

Gradation

1. one root, with possible bifid tip and deep developmental grooves
2. two roots, each separate root must be greater than one-quarter to one-third of total root length
3. three roots, as above

6 - canine root section

Synonymous terms
none

References

Jørgensen (1956)

Application

c⁻

Definition

determination of the cross-section of the canine root; buccal convexity is recorded

Data recording system

Jørgensen (1956)

this system suggests a four-grading graduation, this trait is here recorded on a three-grading graduation

Gradation

0. root narrow buccolingually (large mesiodistally)
1. more curved section & buccolingual breadth bigger than mesiodistal breadth (large buccolingually)
2. marked shape, largest curvature

7 - molar root number**Synonymous terms**

none

References

Turner et al. (1991), Scott & Turner (1997)

Application

m¹, m²

Definition

molar root number

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)
inclusion of the pyramidalism trait – root in the form of a single cone – in the first grade

Gradation

1. one root, with possible bifid tip and deep developmental grooves
2. two roots, each separate root must be greater than one-quarter to one-third of total root length
3. three roots, as above

8 - radix Carabelli**Synonymous terms**

none

References

Schulze (1987), Alt (1997), Alt et al. (1998), Carlsen & Alexandersen (2000)

Application

m¹, m²

Definition

mesiolingual additional root

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

0. absence
1. presence

9 - radix paramolaris**Synonymous terms**

none

References

Schulze (1987), Alt (1997), Alt et al. (1998), Carlsen & Alexandersen (1999)

Application

m¹, m²

Definition

mesiobuccal additional root

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

0. absence
1. presence

10 - idiopathische radices**Synonymous terms**

none

References

Schulze (1987), Alt (1997), Alt et al. (1998)

Application

m¹, m²

Definition

additional root located neither mesiobuccally (radix paramolaris position) nor mesiolingually (radix Carabelli position)

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

0. absence
1. presence

11 - incisors incisal border**Synonymous terms**

none

References

Jørgensen (1956), Moskona et al. (1997)

Application

i¹, i²

Definition

incisors incisal border shape

Data recording system

Jørgensen (1956)
this system suggests a five-grading graduation, this trait is here recorded on a three-grading graduation

Gradation

1. conical incisor (one lobe)
2. rounded distoincisor border
3. squared distoincisor border

12 - talon cusp**Synonymous terms**

margoïde differenzierung

References

Schulze (1987), Alt (1997), Dash et al. (2004), Mays (2005)

Application

i¹, i²

Definition

pinching of the buccal surface which generates a T- or Y-shaped incisive edge

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

0. absence
1. presence

13 - shoveling

Synonymous terms
shovel-shaped tooth

References

Hanihara (1963), Lee & Goose (1972), Lukacs & Walimbe (1984), Turner et al. (1991), Alt (1997) Alt et al. (1998), Sciulli (1998)

Application

i¹, i², c

Definition

development of lingual marginal ridges

Data recording system

Hanihara (1963)

Gradation

0. none: the lingual surface is essentially flat
1. faint: very slight marginal ridges
2. trace: slight marginal ridges can be easily seen
3. semishovel: the ridging is stronger

14 - tuberculum dentale**Synonymous terms**

lingual tubercle, cingular ridge, *tuberculum dentis*, canine tubercle, lingual cusp, dental tubercle

References

Turner et al. (1991), Alt (1997), Sciulli (1998)

Application

i¹, i², c

Definition

crests or tubercle arising from the cingulum region on the lingual surface

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

0. no expression, smooth cingular region
1. faint ridging on the cingular region
2. trace ridging
3. strong ridging
4. pronounced ridging

15 - cusp development**Synonymous terms**

none

References

Lukacs & Walimbe (1984), Sciulli (1998)

Application

m¹

Definition

molar cusp number

Data recording system

Hanihara (1963)

this system suggests a five-grading graduation, this trait is here recorded on a three-grading graduation (taking into account only the number of cusps and not the size)

Gradation

2. two cups
3. three cups
4. four cusps

16 - metacone crest**Synonymous terms**

none

References

Jørgensen (1956)

Application

m¹

Definition

metacone is made up of the usual three main ridges, one of them could be absent

Data recording system

Jørgensen (1956)

Gradation

0. presence of the usual three main ridges
1. the mesial ridge is missing
2. the central ridge is missing

17 - parastyle**Synonymous terms**

paramolar cusp, Bolk cusp, buccal pit (for grade 1)

References

Lukacs (1983a/b), Turner et al. (1991), Scott & Turner (1997)

Application

m¹, m²

Definition

trait occurring on the buccal surface ranging in expression from a pit to a large and well-separated cusp

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

0. buccal surfaces of cusps 2 and 3 are smooth
1. a pit is present in or near the buccal groove between cusps 2 and 3
2. a small cusp with an attached apex is present
3. a medium cusp with a free apex is present
4. a large cusp with a free apex is present
5. a pronounced cusp with a free apex is present
6. extreme shape: free peg-shaped crown attached to the root

18 - Carabelli's trait**Synonymous terms**

mesiolingual tubercle, protostyle, Carabelli's tubercle, Carabelli anomaly, *tuberculus anomalus*

References

Kraus (1951), Hanihara (1963), Joshi (1975), Scott (1980), Turner et al. (1991), Sciulli (1998)

Application

m²

Definition

trait occurring on the lingual side of the mesiolingual cusp (protocone), ranging in expression from a pit to a large and well-separated cusp

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

0. smooth mesiolingual surface
1. a groove is present
2. a pit is present
3. a small Y-shaped depression is present
4. a large Y-shaped depression is present
5. a small cusp without a free apex is present, the distal border of the cusp does not touch the lingual groove separating cusps 1 and 4
6. a medium-sized cusp with an attached apex makes contact with the mediolingual groove
7. a large free cusp is present

19 - metacone

Synonymous terms

distobuccal cusp, cusp 3

References

Dahlberg (1963a), Turner et al. (1991)

Application

m²

Definition

development of the distobuccal cusp or cusp 3

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

0. metacone absent
1. an attached ridge is present at the site of the distobuccal cusp, but there is no free apex
2. a faint cuspule with a free apex is present
3. a weak cusp is present
4. an intermediate cusp is present
5. the metacone is large, but slightly smaller than the hypocone
6. the metacone is equal in size to the hypocone

20 - hypocone

Synonymous terms

distolingual cusp, cusp 4

References

Lukacs & Walimbe (1984), Turner et al. (1991)

Application

m²

Definition

development of the distolingual cusp or cusp 4

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

0. no hypocone
1. faint ridging present at the site
2. a faint cuspule with a free apex is present
3. a small cusp is present
4. an intermediate sized cusp is present
5. a large cusp is present
6. cusp is as large as cusps 1 and 2, maximum expression of the cusp

21 - metaconule

Synonymous terms

none, but according to some people confusion with distal accessory ridge or cusp 5 (trait 22)

References

Kanazawa et al. (1990), Turner et al. (1991), Alt (1997)

Application

m²

Definition

cusp on the oblique groove between the metacone and the hypocone

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998)

Gradation

0. absence
1. presence

22 - distal accessory tubercle

Synonymous terms

cusp 5 and confusion with metaconule (trait 21) according to some people

References

Harris & Bailit (1980), Townsend et al. (1986), Kanazawa et al. (1990), Alt (1997), Sciulli (1998), Scott & Turner (1997)

Application

m²

Definition

a small fifth cusp nestling in the distal fovea between the metacone and the hypocone

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

0. absence of the cusp
1. faint cuspule
2. trace cuspule
3. small cuspule
4. small cusp
5. medium-sized cusp present

23 - mesial paracone tubercle

Synonymous terms

none

References

Alt (1997), Alt et al. (1998)

Application

m²

Definition

additional tubercle belonging to the *accessory tubercle complex* of the mesial border, between the paracone and the protocone, mesiobuccally located tubercle compared to the other tubercles

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

0. absence
1. presence

24 - mesial accessory tubercle

Synonymous terms

none

References

Alt (1997), Alt et al. (1998)

Application

m²

Definition

additional tubercle belonging to the *accessory tubercle complex* of the mesial border, between the paracone and the protocone, mediomesially located tubercle compared to the other tubercles

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

- 0. absence
- 1. presence

25 - protoconule**Synonymous terms**

none

References

Alt (1997), Alt et al. (1998)

Application

m²

Definition

additional tubercle belonging to the *accessory tubercle complex* of the mesial border, between the paracone and the protocone, mesiolingually located tubercle compared to the other tubercles

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

- 0. absence
- 1. presence

26 - lingual paracone tubercle**Synonymous terms**

none

References

Kanazawa et al. (1990), Alt (1997), Alt et al. (1998)

Application

m²

Definition

additional tubercle located on the mesiobuccal cusp on mesiodistal position

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

- 0. absence
- 1. presence

27 - radical number**Synonymous terms**

none

References

Turner (1967), Turner et al. (1991), Scott & Turner (1997), Sciulli (1998)

Application

all teeth

Definition

the number of divisions (radicals) created by the developmental grooves, which may partition a root; the latter can be separated by these divisions or not

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

- 1. one radical, no developmental grooves
- 2. two radicals: 2 developmental grooves and 1 root or 2 roots with no developmental grooves
- 3. three radicals, 3 developmental grooves and 1 root or 1 root with no developmental grooves and 1 root with 2 developmental grooves...
- 4. four radicals, as above
- 5. five radicals, as above
- 6. six radicals, as above
- 7. seven radicals, as above
- 8. eight radicals, as above

28 - enamel line**Synonymous terms**

none

References

Jørgensen (1956)

Application

all teeth

Definition

cervical crown margin extension at a root furcation (exclusion of the recording of enamel pearls), trait recorded on the buccal side only

Data recording system

Jørgensen (1956)

this system suggests a five-grading gradation, this trait is here recorded on a three-grading gradation

Gradation

- 0. none, no enamel extension
- 1. curved enamel extension
- 2. enamel extension extends over the greater part of the buccal surface
- 3. V-shaped enamel line (divided into 2 occlusally convex parts)

29 - radiculæ appendiciformes**Synonymous terms**

none

References

Schulze (1987), Alt (1997), Alt et al. (1998)

Application

i₁, i₂, c.

Definition

small additional root - or radice- which is often located, but not always, close the junction of the roots

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

- 0. absence
- 1. presence

30 - incisors and canine root number

Synonymous terms
none

References
Jørgensen (1956)

Application
 i_1 , i_2 , c.

Definition
incisors and canine root number

Data recording system
Jørgensen (1956)

Gradation

- 1. one root, with possible bifid tip and deep developmental grooves
- 2. two roots, each separate root must be greater than one-quarter to one-third of total root length
- 3. three roots, each separate root must be greater than one-quarter to one-third of total root length

31 - molar root number

Synonymous terms
none

References
Jørgensen (1956), Sciulli (1977), Turner et al. (1991)

Application
 m_1 , m_2

Definition
molar root number

Data recording system
Jørgensen (1956)
inclusion of the pyramidalism trait – root in the form of a single cone – in the first grade

Gradation

- 1. one root, with possible bifid tip and deep developmental grooves
- 2. two roots, each separate root must be greater than one-quarter to one-third of total root length
- 3. three roots, each separate root must be greater than one-quarter to one-third of total root length

32 - radix Citroen

Synonymous terms
none

References
Schulze (1987), Alt (1997), Carlsen & Alexandersen (2000)

Application
 m_1 , m_2

Definition
mesiolingual additional root connected to the presence of the Citroen tubercle

Data recording system
FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

- 0. absence
- 1. presence

33 - radix paramolaris

Synonymous terms
radix praemolarica

References
Schulze (1987), Alt (1997), Carlsen & Alexandersen (1999)

Application
 m_1 , m_2

Definition
mesiobuccal additional root

Data recording system
FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

- 0. absence
- 1. presence

34 - idiopathische radices

Synonymous terms
none

References
Schulze (1987), Alt (1997), Alt et al. (1998)

Application
 m_1 , m_2

Definition
additional root located neither mesiobuccally (radix paramolaris position), neither mesiolingually (radix Citroen position) nor distolingually (radix entomolaris position)

Data recording system
FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

- 0. absence
- 1. presence

35 - radix entomolaris

Synonymous terms
three-rooted lower molars

References
Schulze (1987), Alt (1997), Carlsen & Alexandersen (2000)

Application
 m_1 , m_2

Definition
distolingual additional root

Data recording system
FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

- 0. absence
- 1. presence

36 - incisors incisal border

Synonymous terms
none

References
Jørgensen (1956)

Application
 i_1 , i_2

Definition
incisors incisal border shape

Data recording system
Jørgensen (1956)
this system suggests a five-grading graduation, this trait is here recorded on a three-grading graduation

Gradation
1. conical incisor (one lobe)
2. rounded distoincisor border
3. squared distoincisor border

37 - double lingual tubercle

Synonymous terms
none

References
Jørgensen (1956)

Application
c

Definition
presence of a double lingual tubercle

Data recording system
Jørgensen (1956)

Gradation
0. absence
1. presence

38 - cusp number

Synonymous terms
none

References
Hanihara (1963), Sciulli (1977), Lukacs & Walimbe (1984)

Application
 m_1 , m_2

Definition
molar cusp number

Data recording system
Hanihara (1963)
this system takes into account the number and the size of cusps, we take into account only the number

Gradation
for m_1
3. three cusps
4. four cusps
5. five cusps

for m_2
4. four cusps
5. five cusps
6. six cusps

39 - protostylid

Synonymous terms
paramolar cusp or tubercle, buccal pit, *foramen caecum* (for grade 1), tubercle of Bolk

References
Dahlberg (1963a), Hanihara (1963), Turner et al. (1991), Mayhall (1992), Scott & Turner (1997), Sciulli (1998)

Application
 m_1 , m_2

Definition
a continuum of paramolar features (from a pit to a well developed tubercle) that can be found on the buccal surface of cusp 1 (mesiobuccal cusp), similar in its different expressions to the parastyle

Data recording system
ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation
0. no expression, the buccal surface is smooth
1. a pit occurs in the buccal groove
2. the buccal groove is curved distally
3. a faint secondary groove extends mesially from the buccal groove
4. the secondary groove is slightly more pronounced
5. the secondary groove is stronger and can be easily seen
6. the secondary groove extends across most of the buccal surface of cusp 1
7. a cusp with a free apex occurs

40 - anterior fovea

Synonymous terms
precuspidal fossa

References
Hrdlickà (1924), Turner et al. (1991), Wu & Turner (1993), Scott & Turner (1997)

Application
 m_1 , m_2

Definition
a pit or groove occurring on the anterior occlusal surface, between cusps 1 and 2

Data recording system
ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation
0. anterior fovea absent, uninterrupted sulcus
1. a weak ridge connects the mesial aspects of cusps 1 and 2, producing a faint groove
2. deeper groove
3. even deeper groove
4. long groove and marked mesial ridge

41 - split distostylid

Synonymous terms
none

References
Jørgensen (1956), Sciulli (1977)

Application
 m_1 , m_2

Definition

distostylid (cusp 3 or hypoconid) could be subdivided by the présence of a groove

Data recording system

Jørgensen (1956)

Gradation

- 0. absence
- 1. presence

42 - mid trigonid crest

Synonymous terms

none

References

Wu & Turner (1993), Turner et al. (1991), Scott & Turner (1997).

Application

m₂

Definition

a low enamel ridge occurring connects the middle portions of the mesial cusps (cusps 1 and 2)

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)
the system defines a scale with two sub-phases (phases 1A and 1B), this trait is here recorded on a presence/absence basis

Gradation

- 0. absence
- 1. presence

43 - distal trigonid crest

Synonymous terms

none

References

Hrdlickà (1924), Weidenreich (1937), Hanihara (1961), Turner et al. (1991), Scott & Turner (1997)

Application

m₂

Definition

a low enamel ridge occurring connects the distal portions of the mesial cusps (cusps 1 and 2)

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

- 0. absence
- 1. presence

44 - deflecting wrinkle

Synonymous terms

none

References

Weidenreich (1937), Morris (1970), Axelsson & Kiverskari (1982), Turner et al. (1991), Scott & Turner (1997), Sciulli (1998)

Application

m₂

Definition

a fold in the distal side of the mesiolingual cusp, giving it a pronounced L shape in occlusal view

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

- 0. absence of the trait
- 1. the medial ridge of cusp 2 is straight but shows a midpoint constriction
- 2. the medial ridge is deflected distally but does not make contact with cusp 4
- 3. the medial ridge is deflected distally forming an L-shaped ridge, the medial ridge contacts cusp 4

45 - hypoconulid

Synonymous terms

cusp 5, distobuccal cusp

References

Lukacs & Walimbe (1984), Turner et al. (1991), Scott & Turner (1997), Sciulli (1998)

Application

m₂

Definition

hypoconulid or cusp 5 is situated on the distal occlusal aspect of the lower molars, between cusps 3 and 4, respectively hypoconid and entoconid

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

- 0. no expression of cusp 5
- 1. cusp 5 is very small
- 2. cusp 5 is small
- 3. cusp 5 is medium-sized
- 4. cusp 5 is large
- 5. cusp 5 is very large, as large as the other cusps on the tooth

46 - entoconulid

Synonymous terms

cusp 6, *tuberculum sextum*, *tuberculum accessorium posteriore internum*

References

Turner (1969), Suzuki & Sakai (1973), Luckacs & Walimbe (1984), Turner et al. (1991), Mayhall (1992), Scott & Turner (1997), Sciulli (1998)

Application

m₂

Definition

entoconulid or cusp 6 occurring in the distal fovea of the lower molars, lingual to cusp 5, and is scored relative to the size of cusp 5

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997)

Gradation

- 0. cusp 6 is absent
- 1. cusp 6 is much smaller than cusp 5
- 2. cusp 6 is smaller than cusp 5
- 3. cusp 6 is equal in size to cusp 5
- 4. cusp 6 is larger than cusp 5
- 5. cusp 6 is much larger than cusp 5

47 - metaconulid**Synonymous terms**

cuspid 7, *tuberculum intermedium*, *tuberculum accessorium mediale internum*

References

Turner (1969), Luckacs & Walimbe (1984), Turner et al. (1991), Mayhall (1992), Scott & Turner (1997), Sciulli (1998)

Application

m₂

Definition

metaconulid or cuspid 7 occurring in the lingual groove of the crown, between cusps 2 and 4, respectively entoconid and metaconid

Data recording system

ASU_DAS (Turner et al. 1991, Scott & Turner 1997) the system identifies a scale in four phases: from microforms corresponding to phase 1, subdivided into two phases (1A and 1B), to the development of an entirely separate cuspid (phase 4), the option here is a simplified recording without subdivision of the first phase, but a continuous gradation using the same ASU-DAS definitions (phases 1 to 5)

Gradation

0. absence of cuspid 7
1. a faint cuspid is present, with two lingual grooves present
2. a faint cuspid 7 is expressed as a bulge on the lingual surface of cuspid 2
3. cuspid 7 is more marked, but small
4. cuspid 7 is medium sized
5. cuspid 7 is large

48 - tuberculum paracone**Synonymous terms**

none

References

Alt (1997), Alt et al. (1998)

Application

m₂

Definition

centromesial tubercle sited in the mesial marginal crest area between the mesiobuccal cuspid (protoconid) and the mesiolingual cuspid (metaconid)

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

Gradation

0. absence
1. presence

49 - tuberculum Citroen**Synonymous terms**

metastylid, mandibular Carabelli's trait

References

Alt (1997), Alt et al. (1998)

Application

m₂

Definition

tubercle placed on the lingual side of the metaconid

Data recording system

FU_DTS (Alt 1997, Alt et al. 1998) *originally defined for permanent dentition*

this system suggests a four-grading graduation (from micro expressions to well-developed tubercle), this trait is here recorded on a presence/absence basis

Gradation

0. absence
1. presence

50 - fovea posterior**Synonymous terms**

postcuspidal fovea

References

Jørgensen (1956)

Application

m₂

Definition

posterior fovea (distal) on the hypoconulid

Data recording system

Jørgensen (1956)

this trait is here recorded on a presence/absence basis

Gradation

0. absence
1. presence

51 - trigonid furrow**Synonymous terms**

none

References

Jørgensen (1956)

Application

m₂

Definition

extension of the principal mesiodistal furrow

Data recording system

Jørgensen (1956)

Gradation

0. the furrow is mesially duplicated
1. the furrow is rectilinear

52 - cervical prominence**Synonymous terms**

vestigial cingulum

References

Jørgensen (1956)

Application

m₂

Definition

bulbosity of the buccal surface

Data recording system

Jørgensen (1956)

Gradation

0. the buccal surface is smooth
1. the buccal surface is convex