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## Abstract

The present study was designed to report on the morphological characteristics, body measurements, normal and abnormal body conformation of draught donkeys in Tamboul, Sudan. To achieve the goals of the study 200 donkeys of both sexes were examined visually. Descriptive statistic was used to analyse the data.

In this study three breeds of donkeys were detected in the area namely: *Makadi*, *Reefawi* and a cross between them. The grey and black were the predominant coat colour among the study population, they represented 57.0% of the total colour types detected with a percentage of 28.5% for each of them, while the light-brown, white and brown colour were also reported. Animals with moderate body condition score were found to represent 35.5% of the total population.

The different body measurements (in centimetres) were as follow: height at withers 108cm, head length 43cm, head width 27cm, neck length 59cm, back length 63cm, pelvis length 28cm, pelvis width 32cm.

Forelimb measurements: coronary band to fetlock 9cm, fetlock to knee 22cm, knee to elbow 32cm, elbow to shoulder 28cm, shoulder to withers 40cm. Hind limb measurements: coronary band to fetlock 9cm, fetlock to hock 31cm, hock to stifle 37cm, stifle to hip 29cm.

When comparing between the two breeds i.e. *Refawi* and *Makadi*. The *Reefawi* showed higher values in the different measurements examined, when compared to the *Makadi* breed. Also females showed higher values in most of the measurements in comparison to male donkeys.

Abnormal conformation of the feet area were as follows: 1.5% toe-out unilateral, 16.0% toe-out bilateral, 3.0% toe-in unilateral, 14.5% toe-in

bilateral, 65.0% normal conformation. Examination of the 3<sup>rd</sup> metacarpal bone revealed: 12.5% bench knee and 87.5% normal conformation. Anterior view of forelimbs: 4.5% knock knee, 13.0% anterior deviation, and 80.5% normal conformation. Lateral view of the forelimbs: 1.5% standing under in front, 0.5% cutout under the knee, camped in front 0.5, tide in knee 0.5, open knee 4 and 93.0% normal conformation. Feet in the hind limbs: 0.5% toe-out unilateral, 41.0% toe-out bilateral, 1.5% toe in bilateral, 57.0% normal conformation. Rear view of the hind limbs: 39.5% base wide, 6.5% base narrow, 54.0% normal conformation. Hock joint area: 36.5% cow hock, 2.5 sickle hock and 61.0% normal conformation, Neck region: 6.5% bull neck, 0.5% swan neck, 2.5% ewe neck, 0.5% knife-necked, 90% normal conformation. Back spine region: 10.5% convex, 8.5% concave, 0.5% stepped, and 80.5% normal conformation, Pelvis area: 4.0% goose-rump, and 96.0% normal conformation. Lambo- scaral palpation test: 69.5% positive to palpation test and 30.5% negatives results to palpation test.

It is concluded that the results obtained indicated the presence of a third breed in addition to the Makadi and *Reefawi* already described before. Further studies are required to determine the genetic characteristics of the three breeds. The major abnormal conformation determined in the current investigation may provide new avenues for advanced work with donkey lameness.

## ملخص الدراسة

صممت هذه الدراسة للحصول على قياسات الجسم ومعرفة التراكيب السوية وغير السوية في حمير الجر في منطقة تمبول. لاكمال هذه الدراسة تم فحص 200 حمار من الجنسين فحصاً نظرياً. الاحصاء الوصفي استخدم لتحليل البيانات. خلصت الدراسة ان هنالك ثلاث سلالات: مكادى، ريفاوى وهجين بين السلالتين. اللون الرمادى والاسود كانت هي السائدة بين مجتمع الدراسة، حيث مثلت 57% من انواع اللون الكلية وكانت النسبة المئوية لكل منهم 28.5% بينما اللون البنى الفاتح، الابيض والبنى ذكرت كذلك. قياسات الجسم المختلفة (بالسنتمتر) كمايلي: الارتفاع عندالحارك 108سم، طول الرأس 43سم، عرضه 27سم، طول الرقبة 59سم، طول الظهر 63سم، طول الحوض 28سم، عرضه 32سم. قياسات عظام القائمة الامامية: من الحزام التاجى الى المعقم 9سم، من المعقم الى الرسغ 22سم، من الرسغ الى المرفق 32سم، من المرفق الى الكتف 28سم، من الكتف الى الحارك 40سم، قياسات عظام القائمة الخلفية: من الحزام التاجى الى المعقم 9سم، من المعقم الى العرقوب 31سم، من العرقوب الى الركبة 37سم، من الركبة الى الفخذ 29سم عندالمقارنة بين السلالتين مثلاً الريفاوى والمكادى، الريفاوى اظهر قيم اعلى في مختلف القياسات المدروسة، عند مقارنة بالمكادى، ايضا اناث الحمير اظهرت قيم اعلى في اغلب القياسات مقارنة بالذكور. التركيب غير السوى في منطقة الاقدام كمايلي: 1.5% مقدم حافر متجه للخارج من جانب واحد، 16.0% مقدم حافر متجه للخارج من الجانبين، 3.0% مقدم حافر متجه للداخل من جانب واحد، 14.5% مقدم حافر متجه للداخل من الجانبين، 65.0% مقدم حافر طبيعي. التركيب غير السوى في عظم المشط الثالث كمايلي: 12.5% انحراف عظم السنغ الى الخارج، 87.5% تركيب طبيعي. المظهر الامامى للقائمة الامامية: 4.5% انحراف الرسغ انسياً، 13.0% انحراف الرسغ امامياً، 80.5% تركيب طبيعي. المظهر الجانبي للقائمة الامامية: 1.5% انحراف القائمة للخلف، 0.5% خروج القائمة اسفل الرسغ و 93.5% تكوين طبيعي.

الاقدام في القائمة الخلفية: 0.5% مقدم حافر متجه للخارج من جانب واحد، 41.0% مقدم حافر متجه للخارج من الجانبين، 1.5% مقدم حافر متجه للداخل من الجانبين، 57.0% تركيب طبيعي، المظهرالخلفى للقائمة الخلفية: 39.5%قاعدة عريضة، 6.0%قاعدة ضيقة، 54.5% تركيب طبيعي. منطقة العرقوب: 36.5% عرقوب ابقار، 61.5% تركيب طبيعي. منطقة الرقبة: 6.5% رقبة ثور، 0.5% رقبة البجعة، 2.5% رقبة النعجة، 0.5% الرقبة السكينية و 90.0% تركيب طبيعي. منطقة

الظهر : 10.5% محدب , 8.5% مقعر , 0.5% ظهر مخطو و 80.5% تركيب طبيعي . منطقة الحوض : 4.0% ردف الازوه ,  
96% تركيب طبيعي . اختبار الجس للمنطقة القطنية-العجزية : 52% نتيجة ايجابية لإختبار الجس و 48% سلبية لإختبار الجس .  
من هذه النتائج تم اكتشاف سلالة ثالثة بالاضافة الى المكادى والريفواوى الذين تم وصفهم من قبل . الدراسات اللاحقة مطلوب منها  
تحديد الخصائص الوراثية للسلالات الثلاثة . معظم التراكيب غير السوية التى حددت فى هذا التقصى قد تفتح مجالات جديدة للعمل  
المتقدم عن العرج فى الحمير