Appendix 1. Key characteristics of included studies

Reference	Sample size and level of expertise	Aim of Study	Result	Definition given
Epidemiology (n=31)				
Arend et al[39]	78 rowers (38 female, 40 male), including 15 novice and 63 experienced rowers.	To calculate the prevalence and assess factors that aggravate LBP in rowers.	Point prevalence shown as 10% in males and 21.2% in females. Aggravating factors included weight training, prolonged sitting, and long rowing workouts	LBP defined as "...pain located between L1 and gluteal folds...".
Arumugam et al[31]	-	Review of literature including incidence and risk factors for rowing. To perceive where biomechanics may be involved in management of LBP in rowers.	Area most commonly injured: lumbar spine (up to 53%). Clinical screening of athletes using biomechanics can help reduce injury and enhance performance.	No definition given.
Bahr et al[41]	199 rowers (+ 257 cross-country skiers, 378 orienteers', 197 control subjects).	To contrast LBP symptom prevalence among endurance sports with a variety of loading variables on the lumbar region.	LBP showed increased prevalence in cross-country skiers and rowers over orienteers and control group. Rowers showed most training missed due to LBP than other groups.	"LBP defined as pain, ache, or discomfort in the low back with or without radiation to one or both legs (sciatica)".
Bernardes et al[35]	92 senior medalists in national championships (18 female, 74 male).	To investigate injuries experienced by senior rowers over their competitive rowing lifetime.	Lumbar region most commonly injured area with a high incidence in winter and spring.	"Injury defined as any pain, physical disability or other similar situation needing treatment and preventing the athlete from training or competing".
Farahbakhsh et al[42]	-	To comprehensively gather and evaluate papers surveying LBP in athletes and categorize by point,	Lifetime prevalence of LBP in rowers shown as 83.6%.	No definition given.

		one-year and life-time prevalence.		
Fett et al[27]	1,114 elite athletes (83 rowers) and 116 physically active control group.	To display back pain prevalence and assess contributing factors such as age, sex, training volume and sporting discipline of an elite athlete population compared with a physically active control group.	In rowers, lifetime prevalence shown as 96.4%, 12-month prevalence 95.2%, 3-month prevalence 79.5%, and 7-day prevalence as 67.5%.	"Pain defined as pain, ache or discomfort".
Finlay et al[38]	160 adult amateur rowers.	To explore the prevalence, character, and any associated factors with injury among adult amateur rowers.	Injury rate seen as 5.7 per 1000 rowing sessions. Training volume significantly correlated with rate of injury.	"An injury defined as a musculoskeletal issue which led to adaptation/missing two or more training sessions and/or at least one visit to a healthcare professional".
Foss et al[8]	173 rowers, 209 orienteers', 242 cross-country skiers and 116 control subjects.	Compare LBP symptoms prevalence between former endurance athletes, cross-country skiing, rowing, and orienteering, with an additional non-athletic control group.	Rowers showed more LBP episodes than orienteers. Rowers reported the more common occupational changes due to LBP than other sports. High training volume was a risk factor. Previous LBP episode associated with future LBP.	"LBP defined as pain, ache, or discomfort in the low back with or without radiation to one or both legs".
Hickey et al[36]	172 elite level rowers (84 female, 88 male).	To retrospectively examine injuries to rowers over 10 years (1985-1994).	LBP most common complaint in male rowers (25% of total injuries compared with 15.2% in females).	"An injury was defined as any injury presenting to the medical practitioners of the Australian Institute of Sports

				Medicine Department".
Hosea and Hannafin[84]	-	Review of literature describing rowing stroke biomechanics and injury patterns.	Rowing injuries are commonly related to overuse with lumbar commonly affected.	No definition given.
Howell[20]	17 elite female rowers.	To assess trunk/pelvic muscle strength and flexibility in the study population, document LBP incidence, and determine correlations between injury incidence and musculoskeletal profile.	Elite female rowers have a large LBP incidence. 75% showed hyper flexed lumbar spine. Positive correlation seen between hyper flexed lumbar and LBP incidence. Negative correlation between a stretching program and LBP.	No definition given.
Karlson[85]	-	To help understand rowing mechanics, equipment, and training methods for physicians.	The rowing stroke puts heavy load on the lumbar spine. LBP typically overuse related. Equipment can be modified to alter loading mechanics. Similarly, technique can be coached to help LBP.	No definition given.
Maselli et al[40]	133 elite rowers.	To investigate the prevalence of LBP that may or may not have associated irradiated pain and potentially related risk factors.	Lifetime prevalence shown as 64.7% and one-year prevalence as 40.6%.	No definition given.
McNally et al[64]	-	Non-specific review providing information on the rowing stroke and specific injuries that pertain to rowers.	Describes specific low back injuries said to be endured by rowers including annular tears, disc injury, and facet degeneration, spondylolysis,	No definition given.

			SIJ dysfunction, and osteoporosis.	
Newlands et al[21]	76 international rowers (30 female, 46 male).	To investigate prevalence and incidence of LBP among international-level rowers in New Zealand as well as the link between volumes of training and LBP and the degree to which LBP affects the rower's ability in training and competition.	Prevalence of LBP from 6-25% through year. Incidence 1.67 per 1000 exposure hours. Positive relationship between new LBP and total hours training per month.	"LBP defined as pain, ache or discomfort in the low back with or without referral to the buttocks or legs that has been present for more than one week and/or interrupted at least one training session".
Ng et al[23]	365 adolescent rowers (235 female, 130 male).	To measure and compare the LBP prevalence, levels of pain and any associated aggravating factors in an adolescent population.	Point prevalence of LBP in male (64.6%) and female (52.8%) adolescent rowers. Lower levels on pain scale found in males vs females.	"LBP was defined as pain located between L1 and gluteal folds…".
O'Kane et al[25]	1829 former intercollegiate rowers.	To assess whether having back pain before intercollegiate rowing was a significant risk factor for further back pain in intercollegiate rowers.	Previous episodes of back pain positively linked with future back pain episodes. Rowers with preexisting back pain were less likely to miss longer periods of training due to back pain.	"…definition of back pain was limited to pain that lasted at least 1 week".
Rumball et al[86]	-	Non-specific review to examine injury mechanism, diagnosis and management of injuries that affect the rowing population.	Prevention is the best option. Injury risk factors included abrupt changes in training eg, on-water to land based, sudden increase in weight training, weak core strength, and limited flexibility in lower extremity and lumbar spine.	No definition given.

Smoljanovic et al[34]	743 masters' rowers.	To assess the prevalence of acute and chronic injuries in masters' rowers concerning age, rowing experience, training modality, previous competition level, and current rowing training.	The low back was the most commonly injured area (32.6%). 2.25 injuries per 1000 training sessions/rower. Majority of injuries were chronic.	No definition given.
Smoljanovic et al[37]	634 international level rowers (33% female, 67% male).	To determine various musculoskeletal injuries, present in senior international rowers.	Low back the most common site of injury, 1.75 injuries per 1000 training sessions per rower. Senior rowers who sustained chronic injuries ranked higher in competition than rowers without injury.	No definition given.
Smoljanovic et al[33]	398 junior (under 19) international rowers (42% female, 58% male).	To determine the various musculoskeletal issues, present in elite junior rowers to assess whether factors such as gender, rowing disciple, training program or physical stature may influence injury incidence.	73.8% injuries reported as overuse, 26.2% resulted from a traumatic event. The low back was most commonly injured and female rowers were injured more commonly than male.	"Traumatic injury defined as any sudden tissue damage…resulting from trauma. Overuse injury defined as chronic, long-lasting pain usually connected to the sport activity for which the rowers could not report a specific inciting event".
Socratis et al[28]	211 rowers (55 female, 156 male) of all competitive categories.	To view prevalence, qualities, and etiological factors of injuries to Greek rowers of all rowing levels.	Low back most commonly injured area for female and male rowers. Land training risk factor for both sexes.	"Injury defined as missing one or more training sessions".
Stutchfield and Coleman[22]	26 collegiate male rowers.	To explore any potential interaction between LBP,	No association found between hamstring flexibility and LBP. LBP sufferers had decreased	"LBP was defined as pain or ache in the lumbosacral

		flexibility of hamstring muscles and lumbar spine flexion.	lumbar flexion. Increasing flexibility of hamstrings for LBP prevention may not be required.	region with or without radiation to the buttocks. This included constant LBP and LBP upon movement".
Teitz et al[26]	1561 former intercollegiate rowers.	To assess whether rowers who had back pain during college had an increased likelihood of further back pain over the general population.	Lifetime prevalence of back pain in former rowers showed no differences to the general population. Rowers without back pain in college had greatly lower rates of back pain throughout lifetime than general population.	"Back pain was defined as pain that lasted at least 1 week".
Teitz et al[32]	1632 former intercollegiate rowers.	To view the amount of, and any factors associated with LBP that began during intercollegiate rowing.	Risk factors included age, rowing history before 16 years old, hatchet oar use, free weight training, weight machines, and ergometer particularly lasting >30 min.	"…back pain defined as pain that lasted at least 1 week".
Thornton et al[87]	-	Non-specific review outlining injuries affecting rowers.	Largest injury risk factor seen was a swift increase in training frequency, intensity and/or volume.	No definition given.
Trease et al[29]	153 elite rowers.	To outline the epidemiology of injury and illness in elite rowers.	Lumbar spine most commonly injured region. Dynamic ergometer use associated with decreased incidence and burden of LBP.	"Injury or illness defined as any episode that resulted in the athlete being unable to fully participate in on-water rowing training or competition... for a period over 24 hours".
Trompeter et al[3]	-	Systematic review of literature observing prevalence of back pain in athletes and	Lower back most common region of pain. Highest point prevalence of LBP in rowing.	No definition given.

		the general population.		
Verrall and Darcey[30]	12 international-level rowers and 45 national-level rowers.	To assess major injuries to rowers during high performance five-year training period and whether any relationship exists between training level and injuries.	National level rowers more likely to have an episode of LBP compared with international rower.	"Lower back injuries defined as lower back pain causing the rower to cease training".
Wilson et al[24]	20 international rowers (8 female, 12 male).	To investigate injury in international rowers to identify an injury profile and investigate patterns in training and competition to establish associated risk factors.	Mean injury rate 3.67 per 1000 exposure hours. 44 total injuries reported in 12-month period. Ergometer training load associated with injury risk.	"Injury was defined as a problem that caused the athlete to miss: At least one competition OR at least two training sessions OR Required at least one visit to a health profession of treatment."
Wilson et al[10]	-	To view factors that may be correlated with LBP onset in the rowing population.	Most significant risk factors found in studies; LBP history and volume of training using ergometer.	No definition given.
Biomechanics (n=42)				
An et al[62]	25 experienced rowers.	Examining reaction force of lower limb in rowers with or without back injury history.	No remarkable asymmetry seen between injured and healthy rowers.	"All recruited injured rowers reported nociceptive sensation at the lumbar or thoracic spine during rowing that resulted in cessation of training for at least

				7 days within 12 months before data collection, complying with the definition in Noyes, Lindenfeld, and Marshall (1988)."
Arumugam et al[31]	See Epidemiology.			
Buckeridge et al[88]	12 elite female rowers.	To create an inverse dynamics model to view the influence of incremental stroke rates on kinematics of the lower limb and lumbar-pelvic region.	Great shear and compressive forces seen at L5/S1 and increased with stroke rate occurring simultaneously with increases in lumbar-pelvic flexion may have implications for injury.	No definition given.
Buckeridge et al[89]	22 male rowers (six novice, eight club level, eight elite).	To assess symmetry of the lower limb movement using an ergometer and determine reasons for deviations from symmetry.	All groups showed asymmetry in lower limb movement. Hip asymmetries were greater than knee asymmetries. Increase in work rate caused increase in lumbar-pelvic flexion at catch and reduced lumbar-pelvic flexion at finish.	No definition given.
Burnett et al[90]	18 adolescent female rowers.	To ascertain if the lower lumbar axial rotation (L3-S2) range is lessened in end-range flexion and extension compared to a neutral spine.	Lower lumbar axial rotation was reduced in both end-range flexion and extension.	No definition given.
Caldwell et al[57]	16 adolescent rowers (eight female, eight male).	To assess changes in flexion of the lumbar spine with muscle activity levels of erector spinae during a rowing trial.	Lumbar flexion greatly increased throughout rowing trial along with increases in electromyographic activity of iliocostalis lumborum, longissimus thoracis and lumbar multifidus muscles.	No definition given.

Chan[91]	32 male collegiate rowers.	To determine trunk muscle isometric endurance times of healthy rowers.	Trunk flexors had the best endurance time. No significant contrast observed between lateral flexors left and right.	No definition given.
Clay et al[49]	37 female collegiate rowers (including four coxswains).	To ascertain if scores of the FMS can predict injury incidence including LBP in female collegiate rowers.	FMS scores indicated rowers with a high risk of injury had a higher probability of experiencing LBP. However, the results were not statistically significant. Years of rowing was a component in the higher risk participants.	"An injury defined as an incident that prevents the participant from practice for at least one day".
Davis et al[92]	-	To provide an updated review of literature on thoracic injury and management in rowers.	Prevalence of back pain increasing. Further research needed to determine role of individual muscles.	No definition given.
Dehner et al[93]	13 elite adolescent rowers (eight females, five males).	To investigate whether a device-assisted training program causes the multifidus muscle to increase its microcirculation and muscle performance, resulting in a reduction of exercise-associated LBP.	The training program resulted in an improvement in exercise level in the multifidus muscle and a reduction of patient's pain symptoms.	No definition given.
Dehner et al[94]	14 elite rowers and 16 healthy volunteer athletes.	To observe the hypothesis that exercise-induced LBP in rowers was due to chronic functional compartment syndrome of the multifidus muscle.	Results cannot be adequately explained using the chronic functional compartment syndrome and other factors may have an impact on pain generation during exercise.	No definition given.

Fohanno et al[95]	Ten international male rowers.	To make a comparison between the asymmetries in lower limb joint kinematics and foot force production concerning ergometer type and rowing intensity.	Kinetic asymmetry neither correlated to kinematic asymmetry nor lower limb length asymmetry.	No definition given.
Gibbons[96]	One elite male rower.	To illustrate the role of gluteus maximus in LBP in a rower.	The rower's gluteus maximus muscles were misfiring, reducing the efficiency of the posterior oblique sling. This may predispose the SIJs to injury.	No definition given.
Gill et al[97]	30 collegiate rowers (13 female, 17 male).	To view abdominal musculature of oar side compared with non-oar side in collegiate sweep rowers. Additionally, to view any interaction between muscle thickness symmetry and gender, back pain history and rowing experience.	Absence of clinically significant difference seen between thickness of muscles (transversus abdominus, internal oblique or external oblique) on oar side compared with non-oar side.	No definition given.
Gonzalez et al[59]	31 national female collegiate rowers.	To assess the utility of the FMS™ in picking out rowers vulnerable to experience LBP.	Caution would be justified when employing the FMS™ cut-off score due to its small increase in risk and wide confidence interval.	No definition given.
Holt et al[55]	13 elite male national and international rowers.	To observe spinal kinematic data of the rowing technique to identify injury mechanism. Additionally, to view how technique changes over a	An in-depth report of each stage of the rowing stroke created. Prolonged rowing led to greater ranges of movement through the lumbar spine. This deterioration of technique may have an impact on LBP onset.	No definition given.

		prolonged ergometer rowing session.		
Howell[20]	See Epidemiology.			
Klein et al[98]	25 collegiate male rowers.	To differentiate ability of traditional tests for mobility of the spine and strength of trunk extensors to recognize LBP in rowers.	Commonly used evaluative techniques of measurement of spinal mobility and muscle strength testing was not accurate in recognizing rowers with or without LBP.	No definition given.
Koutedakis et al[99]	89 competitive rowers (41 female and 48 male).	To analyze a possible relationship between knee flexion to extension peak torque ratios and low back injuries in highly active males and females.	The lower the knee flexion to extension peak torque ration the larger the degree of low back injury.	No definition given.
MacManus et al[45]	Seven (six male) non-elite rowers (reliability study). 11 senior/elite male rowers (cross-sectional study).	To ascertain the effectiveness of observing lumbo-pelvic kinematics throughout rowing on the ergometer. Additionally, to view changes in lumbo-pelvic kinematics during rowing as well as between rowers with and without LBP.	No remarkable variability in lumbo-pelvic kinematics between groups or across stages of the test.	No definition given.
Martinez-Valdes et al[56]	18 club and international rowers (5 female and 13 male).	To observe the spatial distribution of erector spinae muscle activity in rowers experiencing or not experiencing LBP.	Rowers with a recent history of LBP had altered magnitude of activation and distribution of erector spinae muscle activity.	No definition given.
Mattes and Wolff[61]	32 high performance junior rowers	To observe the asymmetry of the	Female rowers showed a higher symmetry index of	No definition given.

	(16 female, 16 male).	stretcher force of rowers while racing and training on-water.	stretcher force. Asymmetry decreased with increasing stroke rate but increased as fatigue set in throughout the race.	
Mattes and Wolff[60]	30 elite rowers.	To observe a difference between left and right for scullers and inside vs outside leg asymmetry for sweep rowers on ergometer rowing and in strength test.	Scull rowers showed higher left stretcher force. Sweep rowers showed higher force of the outside leg on the ergometer but non-significant on the leg press.	No definition given.
McGregor[100]	-	An invited review to observe influences on LBP injury rate in rowers and where strategies can be implemented to prevent this.	Various factors named to potentially influence LBP status in rowers including lumbopelvic motion, muscle strength and an adequate warm up.	"Injury was recorded if the athlete had: missed at least one competition OR at least two training sessions OR required at least one visit to a health professional for treatment".
McGregor et al[54]	20 elite male rowers.	To explore intersegmental lumbar spine movement and pelvic motion in rowers with and without LBP.	Rowers with no history of LBP showed the largest amounts of movement in the lower lumbar spine.	"LBP defined as pain experienced in the lumbar spine with or without radiation to the buttock; subjects with sciatica were not included in this study".
McGregor et al[101]	22 elite male rowers.	To measure muscles in the lumbar spine (multifidus, iliopsoas, and erector spinae) during simulated rowing in	Trunk muscles of elite rowers experiencing LBP were markedly larger in a cross-sectional area.	No definition given.

		rowers experiencing or not experiencing LBP.		
McGregor et al[50]	Ten collegiate male rowers.	To assess whether different training intensities during ergometer rowing had effects on spinal kinematics.	Less anterior rotation of the pelvis was seen at the catch position while rowing at higher intensities.	No definition given.
McGregor et al[53]	12 elite female rowers.	To view kinematics of the lumbar spine and pelvis during a routine incremental "step test".	Decreased anterior pelvic rotation at the catch along with less lumbar rotation and larger extension at the finish.	No definition given.
Newlands et al[21]	See Epidemiology.			
Ng et al[52]	20 adolescent male rowers.	To explore whether LBP intensity increases in rowers experiencing LBP during ergometer rowing and to observe whether there are differences in lumbar kinematics in rowers experiencing or not experiencing LBP.	Kinematic differences are present between adolescent male rowers experiencing or not experiencing LBP including greater ranges of upper lumbar spine flexion during the drive phase in rowers experiencing LBP.	No definition given.
Ng et al[18]	36 adolescent male rowers.	To assess the success of a cognitive functional approach to reduction of LBP in adolescent male rowers.	The intervention group showed decreased pain levels during ergometer rowing as well as decreased disability at a 12-week follow-up. Additionally, higher levels of lower limb muscle endurance were observed.	No definition given.
O'Sullivan et al[102]	18 international and national rowers.	To produce a model exploring biomechanics of the repetitive rowing	Rowing technique showed different patterns between rowers and found a strong	No definition given.

		stroke and to use this model to assess whether the rowing stroke is positively correlated with LBP incidence.	connection with LBP incidence.	
Özdinçler et al[58]	22 rowers (> 6 months experience) (6 female, 16 male).	To make a comparison between acute effects of two different applications in rowers with tight hamstrings.	No difference between the different techniques. No significant change found in pain. Kinesiotaping showed decreased tightness through the sit and reach test.	No definition given.
Parkin et al[103]	19 male rowers and 20 non rowing controls.	To outline any strength asymmetry of the leg and trunk muscles in rower's vs controls.	No significant difference was found between the groups for isokinetic and isometric strength of the hamstring and quadriceps muscle groups.	No definition given.
Perich et al[19]	90 adolescent female rowers and 131 adolescent controls.	To assess whether a multidimensional intervention program could be useful in decreasing LBP incidence.	The intervention group showed lower incidence of LBP during mid- and end-season and improved fitness levels.	No definition given.
Pollock et al[48]	Nine elite female rowers.	To distinguish the electromyography of trunk muscles with kinematics of the pelvis and spine during the rowing stroke of elite female rowers.	Trunk muscles showed similarities in timing of activation with minimal coactivation of flexors and extensors.	No definition given.
Retailleau et al[104]	Three national rowers (one female, two male).	To view the kinematics of the low back muscles during rowing.	Sit and reach test not an appropriate estimate of low back muscles maximum passive length.	No definition given.
Roy et al[105]	23 elite collegiate male rowers.	To ascertain the use of electromyography in identifying rowers with LBP using	All rowers with LBP correctly identified. Suggests utility of muscle fatigue and recovery measurements as identifiers for clinical LBP.	"To be classified as having LBP, a subject must have reported a single or recurring

		erector spinae muscle.		incidence of LBP during the past year which interfered with activities of daily living, including rowing or training activities".
Strahan et al[106]	Ten high-level rowers.	To assess whether spinopelvic kinematic differences are present in high-level rowers not experiencing LBP in both sweep and scull ergometer rowing.	Both sweep and scull rowing displayed close to end of range flexion through the lower lumbar spine at the catch and early drive phases. Sweep rowing showed increased lateral bend throughout stroke.	No definition given.
Stutchfield and Coleman[22]	See Epidemiology.			
Wilson et al[47]	19 elite male rowers.	To compare lumbar spine motion in a sagittal plane during ergometer rowing and single scull rowing. Comparisons made between maximum voluntary lumbar spine flexion. Further to assess result of fatigue on sagittal plane motion in the mid-lumbar spine.	Ergometer rowing showed a greater range motion of lumbar spine than rowing in a boat. Changes in lumbar spine movement during ergometer rowing may be linked to LBP.	No definition given.
Wilson et al[46]	12 elite male rowers.	To explore the amount the lumbar spine shifts in the frontal plane during ergometer rowing as well as the effects of exhaustion and stroke rate on changes to	Increasing stroke rate was a significant predictor for increasing angle of the lumbar spine. Effect of exhaustion not confirmed.	No definition given.

		lumbar spine movement in the frontal plane.		
Biopsychosocial (n=5)				
Cañeiro et al[107]	One adolescent club-level male rower.	To present a case report showing use of cognitive functional therapy for LBP management.	Pain while ergometer rowing was reduced as well as functional disability. Lower limb and back muscle endurance improvements were reported.	No definition given.
Ng et al[18]	See Biomechanics.			
Perich et al[19]	See Biomechanics.			
Thorpe et al[65]	82 adolescent female rowers.	To assess effectiveness of a specific physiotherapy intervention aimed to reduce LBP and disability in adolescent female rowers.	The intervention showed a significantly lowered LBP prevalence through the rowing season.	"Prevalence of LBP was defined as pain intensity of a VAS score greater than 1, to eliminate low levels of discomfort associated with rowing and muscle fatigue".
Wilson et al[63]	25 senior rowers (12 female and 13 male).	To investigate the lived experience of senior rowers with LBP related to their rowing.	A culture of concealment of pain was discussed as well as fear and isolation.	LBP defined as "a pain, ache or discomfort in the low back with or without referral to the buttocks or legs that has been or was present for more than 1 week and/or interrupted at least one training session".
Miscellaneous (n=6)				
Boland and Hosea[68]	-	To explore rowing techniques, conditions, and	The back and knees are most commonly injured areas.	No definition given.

		injuries in senior rowers.		
Devereaux and Lachmann[67]	-	To observe the results of athletes after attending a sports injury clinic.	Athletes found benefit from visiting the clinic.	No definition given.
Goldstein et al[108]	One adolescent male rower.	To view the success of direct pars osteosynthesis using CT navigation with a curvilinear subspinous modular link for repair of spondylolysis in an adolescent male rower.	The treatment was effective for pars fracture that preserved the native facet joint. The patient returned to rowing and all sporting activities with no restrictions and no LBP.	No definition given.
Reid and McNair[69]	-	To establish factors that may affect LBP onset.	The repetitive movement along with the great forces involved in the rowing stroke cause potential for lumbar spine injury.	No definition given.
Smoljanovic et al[66]	-	To examine the viability of increasing adaptive rowing race distances to 2000 meters from a sports injury and health perspective.	No contraindications for adaptive rowing events of 2000 meters based on the current literature review.	No definition given.
Stallard[70]	-	To investigate back pain among rowers.	Complaints of back pain in rowers is increasing suggesting it may be related to the modern style of rowing.	No definition given.